

RELOADING GUIDE

for Centerfire Cartridges

2/2002



VIHTAVUORI

Burning Rate Chart

Current canister powders in order of *approximate* burning rate. This list is approximate only and **not** to be used for developing loads.

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1. **R-1**, Norma
2. **N310**, VIHTAVUORI
3. **Bullseye**, Hercules
4. **Solo 1000**, Scot
5. **No 2**, Accurate Arms
6. **Red Dot**, Hercules
7. **Clays**, Hodgdon
8. **N320**, VIHTAVUORI
9. **Royal Scot**, Scot
10. **HP-38**, Hodgdon
11. **231**, Winchester
12. **453**, Scot
13. **Hi-Skor 700-X**, IMR Co.
14. **WST**, Winchester
15. **International**, Hodgdon
16. **Green Dot**, Hercules
17. **N330**, VIHTAVUORI
18. **PB**, IMR Co.
19. **No 5**, Accurate Arms
20. **Pearl Scot**, Scot
21. **WSL**, Winchester
22. **Universal**, Hodgdon
23. **Unique**, Hercules
24. **SR-7625**, IMR Co.
25. **WSF**, Winchester
26. **HS-6**, Hodgdon
27. **N340**, VIHTAVUORI
28. **540**, Winchester
29. **Herco**, Hercules
30. **SR-4756**, IMR Co
31. **Solo 1250**, Scot
32. **3N37**, VIHTAVUORI
33. **Hi-Skor 800-X**, IMR Co.
34. **No. 7**, Accurate Arms
35. **Solo 1500**, Scot
36. **N350**, VIHTAVUORI
37. **3N38**, VIHTAVUORI
38. **HS-7**, Hodgdon
39. **Blue Dot**, Hercules
40. **N105**, VIHTAVUORI
41. **No. 9**, Accurate Arms
42. **2400**, Hercules
43. **N110**, VIHTAVUORI
44. **R-123**, Norma
45. **H110**, Hodgdon
46. **296**, Winchester
47. **SR-4759**, IMR Co.
48. **N120**, VIHTAVUORI
49. **IMR-4427**, IMR Co.
50. **H4227**, Hodgdon
51. **N130**, VIHTAVUORI
52. **1680**, Accurate Arms
53. **N-200**, Norma
54. **N133**, VIHTAVUORI
55. **Brigadier 4197**, Scot
56. **H4198**, Hodgdon
57. **IMR-4198**, IMR Co.
58. **2015**, Accurate Arms
59. **Reloder 7**, Hercules
60. **IMR-3031**, IMR Co.
61. **N-201**, Norma
62. **H322**, Hodgdon
63. **2230**, Accurate Arms
64. **Brigadier 3032**, Scot
65. **748**, Winchester
66. **BL-C(2)**, Hodgdon
67. **2460**, Accurate Arms
68. **H335**, Hodgdon
69. **H4895**, Hodgdon
70. **Reloder 12**, Hercules
71. **IMR-4895**, IMR Co.
72. **N135**, VIHTAVUORI
73. **IMR-4064**, IMR Co.
74. **Brigadier 4065**, Scot
75. **2520**, Accurate Arms
76. **IMR-4320**, IMR Co.
77. **N-202**, Norma
78. **N540** VIHTAVUORI
79. **N140**, VIHTAVUORI
80. **2700**, Accurate Arms
81. **Reloder 15**, Hercules
82. **H380**, Hodgdon
83. **760**, Winchester
84. **H414**, Hodgdon
85. **N550**, VIHTAVUORI
86. **N150**, VIHTAVUORI
87. **4350**, Accurate Arms
88. **IMR-4350**, IMR Co.
89. **H4350**, Hodgdon
90. **N-204**, Norma
91. **Brigadier 4351**, Scot
92. **Reloder 19**, Hercules
93. **N160**, VIHTAVUORI
94. **N560**, VIHTAVUORI
95. **IMR-4831**, IMR Co
96. **H4831**, Hodgdon
97. **3100**, Accurate Arms
98. **MRP**, Norma
99. **N165**, VIHTAVUORI
100. **Reloder 22**, Hercules
101. **IMR-7828**, IMR Co.
102. **8700**, Accurate Arms
103. **N170**, VIHTAVUORI
104. **H1000**, Hodgdon
105. **H870**, Hodgdon
106. **24N41**, VIHTAVUORI
107. **50BMG**, Hodgdon
108. **20N29**, VIHTAVUORI

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Preface

THIS NEW VIHTAVUORI RELOADING GUIDE 2/2002 REPLACES ALL RIFLE AND HANDGUN RELOADING DATA PUBLISHED IN PREVIOUS RELOADING GUIDES INCLUDING EDITIONS FROM 1st TO 7th. IN ORDER TO ENSURE THE HIGHEST POSSIBLE LEVEL OF SAFETY PREVIOUS GUIDES SHOULD NO LONGER BE USED.

The new Vihtavuori Reloading Guide 2/2002 for Centerfire Ammunition is an updated version of the previous Vihtavuori Reloading Guide 1/2002. The contents of this new issue 2/2002 has been revised with new loading data for:

- Lapua's famous 200 gr D166 FMJBT bullet in cal. 7.62 x 54R,
- cal. 7.5 x 55 GP31(7.5mm Swiss,
- cal. 300 Remington Ultra Magnum,
- cal. .38 LAPUA Super, Lapua's improved .38 Super Auto.

All the loads in this guide are pressured according to the CIP method. The maximum loads given in the tables are determined according to the CIP/SAAMI maximum pressure specifications, whichever is lower. The listed maximum loads must never be exceeded.

Due to the differences in the cartridge components, individual weapons, shooting temperatures etc. always start developing your load by using the starting load according to the loading data. If there is no indication of the starting load, use 15 % lower charge than the listed maximum load as your starting load.

The Vihtavuori powders are manufactured by Nexplo Vihtavuori Oy in Vihtavuori plant. Sales and marketing of reloading powders as well as customer service is carried out by Nammo Lapua Oy. Vihtavuori powders are distributed through Vihtavuori Distributors. The list of Distributors can be found at www.vihtavuori.fi/Distributors.html The contact information for customer service is given in the back of this guide.

We wish you successful reloading with Vihtavuori powders.



Rifle Powders

N100 series

The series N100 powders are primarily rifle powders, with suitable speeds to optimize handloading from the tiny .17 Remington and .22 Hornet all the way to the monster bashing .458 Winchester Magnum. There are ten speeds in this series and they include:

N110: This is a very fast burning propellant that can be used in applications which previously used Hercules 2400, Hodgdon H110, or Winchester 296. Typical applications include: .22 Hornet, .25-20 Winchester, .357 S&W Magnum, .357 Maximum, .44 Magnum, and .45 Winchester Magnum.

N 120: This speed needs higher pressure than N110 in order to optimize burning. Burning rate falls near the various 4227s. It works superbly with comparatively light bullets in .22 caliber cartridges. It is, by nature, a limited application propellant.

N130: Burning rate is between IMR4227 and the discontinued Winchester 680. This is the powder used in factory loaded .22 and 6mm PPC.

N133: This speed is very close to IMR 4198 in quickness. Thus, it is ideal for the .222 Remington, .223 Remington, and .45-70 Government and other applications where a relatively fast burning rifle propellant is needed.

N135: This is a moderate burning propellant. It will fit applications similar to Hercules Reloder 12, IMR-4895 or IMR 4064. Applications range from the .17 Remington to the .458 Winchester.

N140: This powder can usually be used in place of Hercules Reloder 15, IMR 4320, and Hodgdon H380. Applications include: .222 Remington Magnum, .22-250 Remington (factory powder), .30-30 Winchester, .308 Winchester, .30-06 Springfield, .375 H&H Magnum, and so on.

N150: This is a moderately slow powder that can help refine rifle cartridge ballistics when N140 is just a tad too fast and N160 is a tad too slow. Works well in many applications previously filled by 760, H414, and IMR 4350.

N160: A relatively slow powder ideally suited to many magnum and standard rounds requiring a slow propellant. It has characteristics that makes it work well for applications previously using various 4350's, Hercules Reloder 19, and the various 4831's. For example some ideal applications are: .243 Winchester, .25-06 Remington, .264 Winchester Magnum, .270 Winchester (factory load), 7mm Remington Magnum, .30-06 Springfield, .300 Winchester Magnum, .338 Winchester Magnum, .375 H&H Magnum, etc. This is destined to being one of our most popular powders.

N165: A very slow burning magnum propellant for use with heavy bullets. Applications begin very heavy bullets in the .30-06, and include the .338 Winchester Magnum.

N170: Our slowest speed propellant and the slowest canister reloading powder generally available from any manufacturer.

N500 series

Adding nitroglycerol to the traditional single base powder makes possible in addition to geometry and coating a third controlled variable of ballistic properties: energy content. Vihtavuori calls powders which have nitroglycerol added (maximum 25 %) high energy NC-powders, which form N500 series.

Adding nitroglycerol to the high energy N500 series is done by impregnation. After that the grains are coated with a new type of chemical which results in very progressive burning characteristics.

The composition of a typical high energy powder is as follows:

* nitrocellulose	* nitroglycerol
* coating agent	* stabilizer
* flame reducing agent	* wear reducing agent

Geometrically the powders in the N500 series are equal to the N100 series. Although these new powders have a higher energy content, they do not cause greater wear to the gun. This is because the surface of the powder has been treated with an agent designed to reduce barrel wear.

N500 series powders work well at different temperatures, even better than the traditional N100 and N300 series. Temperature sensitivity naturally depends very much on the weapon and on the cartridge. The manufacturing technique employed permits a very high bulk density, which in turn makes it possible to use a bigger charge in a certain limited loading volume.

Vihtavuori High Energy powders are available in three burning rates:

N540: Burning rate like N140. Especially for .308 Winchester.

N550: Burning rate like N150. Especially for .308 Winchester and .30-06 Springfield.

N560: Burning rate like N160. Especially for .270 Winchester and 6.5 x 55 Swedish Mauser.

Powders For .50 BMG

For .50 BMG there are two special Vihtavuori powders available, 24N41 and 20N29. They are, like N100 series, single base surface treated powders. The burning rate of them is slower and their grain size is larger than that of the N100 series rifle powders. 24N41 is slightly faster burning than 20N29.

Handgun Powders

Handgun powders include the five N300 series propellants and two special propellants:

N310: Very fast burning and competitive with Bullseye and Accurate No.2. It has applications in a very wide range from the .25 ACP to the 9mm Luger.

N320: is a handgun powder of comparatively fast burning rate. Useful in many popular cartridges. Currently available data includes 9mm Luger, .38 Special, .357 Magnum, .44 Magnum, .45 ACP and .45 (Long) Colt. Burning rate generally is perhaps a tad faster than 231 or generally about like Red Dot.

N330: This is a handgun powder that has a burning rate similar to Green Dot, No. 5, or PB. Data is currently available for 9mm Luger, .38 Special, .40 S&W, .44 S&W Special and .45 (Long) Colt.

N340: With a burning rate not dissimilar to Winchester 540 or Herco, this powder is a wide application type. Data for the following handgun cartridges is currently available: .30 Luger, 9mm Luger, .38 S&W (Colt New Police), .38 Super Auto, .38 Special, .357 Magnum, .44 Magnum, .45 Auto and .45 (Long) Colt.

N350: This is the slowest burning propellant in the N300 series. Burning speed is about like Blue Dot, "Hi-Skor" 800-X or No. 7. Data is currently available for: 9mm Luger, .38 Super Auto, .38 Special, .357 Magnum, .44 Magnum and .45 Auto.

3N37: Burning speed is between N340 and N350, close to "Hi-Skor" 800-X, and it therefore has applications also in handgun cartridges. Data is currently available for all popular handgun calibers. The characteristics of this propellant makes it very desirable for competitive handgun shooting.

3N38: A powder for the high velocity loads of the 9mm Luger and the .38 Super with moderate bullet weight. Designed specially for competitive handgun shooting.

N105 Super Magnum: This special powder has a burning rate between N350 and N110. It is especially developed for handgun cartridges with heavy bullets and/or large case volume. Reloading data is currently available for 9 x 21mm, .38 Super Auto, .357 Magnum, .40 S&W, 10mm Auto, .44 Remington Magnum and .45 Winchester Magnum.

About the Data

Disclaimer

As Nammo Lapua Oy has no control over improper storage, handling, loading or use of our powders after they have left the factory, we make no warranty of any kind, either expressed or implied, limited or full. We specifically disclaim all warranties of fitness for a particular purpose and merchantability. We specifically disclaim all liability

for consequential damages of any kind whatsoever, whether or not due to seller's negligence or based on strict product liability or principle of indemnity or contribution, Nammo Lapua Oy neither assumes nor authorizes any person to assume for it any liability in connection with the use of this product.

How To Use The Data

Our rifle and handgun data listings generally contain maximum charges which are not to be exceeded. In some instances starting loads are also listed. Currently this booklet contains all of the data we can supply. Be certain you use the correct data and the specific bullet weight shown.

By staying 5 % below the maximum powder charge weight, pressures will be reduced by about 10 % while velocities will be only about 3 % lower than listed.

Caution: When loading handgun cartridges it is vital to maintain the minimum cartridge overall length (C.O.L.) listed in the tables. Shorter overall lengths may double chamber pressures. Longer lengths are permissible so long as the functioning of the handgun will not be impaired.

The data in the loading tables were obtained at an ambient temperature of 68 degrees Fahrenheit and relative humidity of 55 %. The values obtained were under carefully controlled conditions and may vary from those obtained with your firearm, specific component lots, loading dimensions, and loading procedures. The maximum charges must NEVER be exceeded. **Start loading with the starting load according to the loading data. If there is no indication of the starting load, use 15 % lower charge than the listed maximum.** When loading cartridges for which the listed charge is 10 grains or less, after firing 10 rounds at the minimum weight (15 % below maximum), increase charge weights by 0.2 grains and fire another 10 rounds. Repeat this procedure, if necessary, until you reach, but do not exceed, the maximum listed charge. The same process is followed for heavier charges except that charge weights from 11 to 25 grains use increments of 0.5 grains. For charges over 25 grains increments of 1.0 grains will be correct.

If even a single test round shows signs of excessive pressure discontinue the use of the load. Do not fire even a single additional cartridge. Seek qualified help before proceeding!

The traditional sign of overpressure is a flattened primer. When flattened primers start to occur, it is a definite warning that the charge should be reduced, quickly. Brass getting into the ejector and extractor cavities is a worse case. Blown out primers are worse still. If a case ruptures it may be a sign of a defective case or a truly lethal chamber pressure.

In case of overpressure signs it is wiser to back off, to be safe rather than sorry. Why risk potentially fatal injury?

Better to stop shooting and immediately discard all such reloads.

Read also the Reloading Safety Rules on pages 9 and 10.

Pressure

There are numerous factors which can change the ballistic performance of a load even when the data is followed exactly. For example: The internal dimensions of a firearm can vary greatly even between two of the same make and model. Pressures can vary to extremes as different firearms are used. Each change in brand and even within different lots of a specific brand component can cause notable ballistic changes. Too, changes in ambient temperature can also cause ballistic altering pressures. Not every bullet of a given diameter and weight will produce alike pressure. Changes in case brand can also effect ballistics. There are numerous other causes of varying pressure levels.

Therefore it is essential that the reloader be well versed in the methods of carefully working up a reload powder charge in small increments as outlined in the various reloading handbooks that are available from reliable sources. The data in this book is not intended for use by persons not thoroughly versed in such procedures.

This guide must be supplemented by a good reloading handbook such as the Lapua Reloading Manual, the DBI Metallic Cartridge Reloading, the Vihtavuori Reloading Manual or other recognized manuals that may offer all appropriate information.

Properties of Smokeless Powder

Smokeless powders, or propellants, are essentially mixtures of chemicals designed to burn under controlled conditions at the proper rate to propel a projectile from a gun.

Smokeless powders are made in three forms:

1. Thin, circular flakes or wafers
2. Small cylinders
3. Small spheres

Single-base smokeless powders derive their main source of energy from nitrocellulose.

The energy released from double-base smokeless powders is derived from both nitrocellulose and nitroglycerine.

All smokeless powders are extremely flammable by design, they are intended to burn rapidly and vigorously when ignited.

Oxygen from the air is not necessary for the combustion of smokeless powders since they contain sufficient built-in oxygen to burn completely, even in an enclosed space such as the chamber of a firearm.

In effect, ignition occurs when the powder granules are heated above their ignition temperature. This can occur by exposing powder to:

1. A flame such as a match or primer flash.
2. An electrical spark or the sparks from welding, grinding, etc..
3. Heat from an electric hot plate or a fire directed or near a closed container even if the powder itself is not exposed to the flame.

When smokeless powder burns, a great deal of gas at high temperature is formed. If the powder is confined, this gas will create pressure in the surrounding structure. The rate of gas generation is such, however, that the pressure can be kept at a low level if sufficient space is available or if the gas can escape.

In this respect smokeless powder differs from blasting agents or high explosives such as dynamite or blasting gelatin, although smokeless powder may contain chemical ingredients common to some of these products.

High explosives such as dynamite are made to detonate, that is, to change from solid state to gaseous state with evolution of intense heat at such a rapid rate that shock waves are propagated through any medium in contact with them. Such shock waves exert pressure on anything they contact, and, as a matter of practical consideration, it is almost impossible to satisfactorily vent away the effects of a detonation involving any appreciable quantity of dynamite.

Smokeless powder differs considerably in its burning characteristics from common "black powder".

Black powder burns essentially at the same rate out in the open (unconfined) as when in a gun.

When ignited in an unconfined state, smokeless powder burns inefficiently with an orange-colored flame. It produces a considerable amount of light brown noxious smelling smoke. It leaves a residue of ash and partially burned powder. The flame is hot enough to cause severe burns.

The opposite is true when it burns under pressure as in a cartridge fired in a gun. Then it produces very little smoke, a small glow, and leaves very little or no residue. The burning rate of smokeless powder increases with increased pressure.

If burning smokeless powder is confined, gas pressure will rise and eventually can cause the container to burst. Under such circumstances, the bursting of a strong container creates effects similar to an explosion.

For this reason, the Department of Transportation (formerly Interstate Commerce Commission) sets specifications for shipping containers for propellants and requires tests for loaded containers - under actual fire conditions - before approving them for use.

When smokeless powder in D.O.T. approved containers is ignited during such tests, container seams split open or lids pop off - to release gases and powder from confinement at low pressure.

How to Check Smokeless Powder for Deterioration

Although modern smokeless powders are basically free from deterioration under proper storage conditions, safe practices require a recognition of the signs of deterioration and its possible effects.

Powder deterioration can be checked by opening the cap on the container and smelling the contents.

Powder undergoing deterioration has an irritating acidic odor. (Don't confuse this with common solvent odors such as alcohol, ether and acetone).

Check to make certain that powder is not exposed to extreme heat as this may cause deterioration. Such exposure produces an acidity which accelerates further reaction and has been known, because of the heat generated by the reaction, to cause spontaneous combustion.

Never salvage powder from old cartridges and do not attempt to blend salvaged powder with new powder. Don't accumulate old powder stocks. The best way to dispose of deteriorated smokeless powder is to burn it out in the open at an isolated location in small shallow piles (not over 1" deep). The quantity burned in any one pile should never exceed one pound. Use an ignition train of slow burning combustible material so that the person may retreat to a safe distance before powder is ignited.

Considerations for Storage of Smokeless Powder

Smokeless powder is intended to function by burning, so it must be protected against accidental exposure to flame, sparks or high temperatures.

For these reasons, it is desirable that storage enclosures be made of insulating materials to protect the powder from external heat sources.

Once smokeless powder begins to burn, it will normally continue to burn (and generate gas pressure) until it is consumed.

D.O.T. approved containers are constructed to open up at low internal pressures to avoid the effects normally produced by the rupture or bursting of a strong container.

Storage enclosures for smokeless powder should be constructed in a similar manner:

1. Of fire-resistant and heat-insulating materials to protect contents from external heat.
2. Sufficiently large to satisfactorily vent the gaseous products of combustion which would result if the quantity of smokeless powder within the enclosure accidentally ignited.

If a small, tightly enclosed storage enclosure is loaded to capacity with containers of smokeless powder, the walls of the enclosure will expand or move outwards to release the gas pressure - if the powder in storage is accidentally ignited.

Under such conditions, the effects of the release of gas pressure are similar or identical to the effects produced by an explosion.

Hence only the smallest practical quantities of smokeless powder should be kept in storage, and then in strict compliance with all applicable regulations and recommendations of the National Fire Protection Association.

Recommendations for Storage of Smokeless Powder

STORE IN A COOL, DRY PLACE. Be sure the storage area selected is free from any possible sources of excess heat and is isolated from open flame, furnaces, hot water heaters, etc. Do not store smokeless powder where it will be exposed to the sun's rays. Avoid storage in areas where mechanical or electrical equipment is in operation. Restrict from the storage areas heat or sparks which may result from improper, defective or overloaded electrical circuits.

DO NOT STORE SMOKELESS POWDER IN THE SAME AREA WITH SOLVENTS, FLAMMABLE GASES OR HIGHLY COMBUSTIBLE MATERIALS. **STORE ONLY IN DEPARTMENT OF TRANSPORTATION APPROVED CONTAINERS.**

Do not transfer the powder from an approved container into one which is not approved.

DO NOT SMOKE IN AREAS WHERE POWDER IS STORED OR USED. Place appropriate "NO SMOKING" signs in these areas.

DO NOT SUBJECT THE STORAGE CABINETS TO HEAT. **SHOULD BE CONSTRUCTED OF INSULATING MATERIALS AND WITH A WEAK WALL, SEAMS OR JOINTS TO PROVIDE AN EASY MEANS OF SELFVENTING.**

DO NOT KEEP OLD OR SALVAGED POWDERS. Check old powders for deterioration regularly. Destroy deteriorated powders immediately.

OBEY ALL REGULATIONS REGARDING QUANTITY AND METHODS OF STORING. Do not store all your powders in one place. If you can, maintain separate storage locations. Many small containers are safer than one or more large containers.

KEEP YOUR STORAGE AND USE AREA CLEAN. Clean up spilled powder promptly. Make sure the surrounding area is free of trash or other readily combustible materials.

The above information has been provided with permission from SAAMI: SPORTING ARMS AND AMMUNITION MANUFACTURERS' INSTITUTE, INC. P.O. Box 838, Branford, CT 06405.

Reloading Safety

Reloading is an enjoyable and rewarding hobby that is easily conducted with safety. But like many other human endeavours, carelessness or negligence can make reloading hazardous. The essence of reloading safety is proper handling and storage of primers and powder. As important is strict following of the instructions given by the manufacturers of the reloading equipment as well as the reloading components.

Before you get started, read the safety rules below and keep them in mind whenever reloading. Attention paid to detail and patience ensures safety and quality!

- Reload only when you can give it your undivided attention. **Do not reload**, when fatigued or ill. Develop your own reloading routine to avoid mistakes. Avoid haste, load at a leisurely place and keep in mind that **absolutely no reloading under the influence of alcohol or drugs!**
- Always wear proper eye protection. It is an unnecessary risk to reload without safety glasses.
- Store powder and primers out of reach of children and away from heat and open fire. **Follow the manufacturer's instructions on your powder canister. Never smoke during a reloading session!**
- Keep no more powder than needed available. Immediately return the unused powder to its original factory container to preserve its identity and usable life time.
- Do not use any powder unless its identity is positively known. Scrap all unidentified powders according to the manufacturer's instructions on your powder canister. **Keep in mind that the trial-and-error method may lead to serious injury!**
- **Do not store primers in bulk! Doing so will create a bomb!** Bulk primers will very likely mass detonate. The blast of a few hundred primers corresponds to a hand grenade in a room! Do not force primers in any circumstances. Take special care when filling and handling auto primer feed tubes. Keep primers in their original factory packing until used. Return unused primers to their original packing.
- Do not use primers if their identity is lost. Discard them according to the manufacturer's instructions.
- Start loading with the starting load according to the loading data. If there is no indication of the starting load, use 15 % lower charge than the listed maximum load. Increase the charge using small steps watching for overpressure signs from the primer and the case head at each step. **If you detect overpressure signs immediately stop shooting and reduce the charge.** Disassemble always the defected cartridges. **NEVER EXCEED THE MAXIMUM LOADS!**
- Check visually the powder level in the cases so you are absolutely sure that you have no double powder charge. When a double powder charge is fired it may result in a gun damage, personal injury, even death.
- If you change the lot of any component or if you change any of the components of your reload, you must develop your load from the starting load again. A different component as well as a component from a different manufacturing lot may cause changes in cartridge pressure.
- You must absolutely follow the given cartridge overall lengths (C.O.L.) according to the reloading tables. The change in the bullet seating depth has a significant influence on the cartridge pressure.
- **Never reduce loads under the listed starting load.**
- Keep your reloading bench in good order. Clean up spilled powder and primers promptly and completely. Remember that the reloading bench is not a temporary store for other tools, used car spare parts etc.
- Use your reloading equipment according to the manufacturer's recommendations. Study the instructions carefully and don't hesitate to ask, if you don't understand everything.
- **Be safe, be conscientious!**

Reloading Safety

LEAD EXPOSURE

A continuous lead exposure has been found out to create lead accumulation to living bodies, specially to the nervous system causing little by little serious physical impairment. Some unused reloading components as well as fired cases can contain lead or lead compounds, it is possible to a reloader to get exposed during reloading. Primers and bullets contain lead and it may be present as a residue in fired cartridge cases, too.

There are different ways lead may enter the body. However, the two most common are considered to be the mouth and the breathing. Therefore with simple precautions described underneath the possible lead exposure and its dangerous consequences can be avoided.

- **WASH YOUR HANDS** thoroughly with warm water and soap after shooting or reloading.
- **DO NOT EAT OR DRINK** during a reloading session. When handling fired cartridge cases the residual containing lead most likely gets to your hands. Therefore eating something requiring a straight hand contact during a reloading session hazards the reloader to lead exposure. Keep your hands away from your nose or your mouth during a reloading session.
- **KEEP GOOD HOUSEHOLD AT YOUR RELOADING SITE.** Regular cleaning prevents the accumulation of residuals. Use a damp cloth or mop to clean up the reloading bench as well as the floor underneath. **DO NOT USE A VACUUM CLEANER!** The use of it due to a potential risk of exposure because of spilled powder it collects up. Furthermore an ordinary vacuum cleaner more spreads than collects up the dust containing residuals. Do not use any carpet at your reloading site. Carpet is hard to keep dust-free and it can create static electricity that can accidentally fire a primer.
- **PROTECT YOUR BREATHING AGAINST THE DUST IN THE RELOADING AREA.** When using a dry cleaning media in tumbling the cartridge cases keep in mind that the lead residual from the fired cases moves to the dry cleaning media, where it accumulates by use. Wear always a dust mask when pouring the dry cleaning media out of the tumbler and be careful not to spill the media on your reloading bench.

RIFLE RELOADING DATA

DISCLAIMER

I. All of this reloading information has been provided by Nexplo Vihtavuori Oy and Nammo Lapua Oy. The data given here were obtained in laboratory conditions following strictly the CIP (Commission International Permanente) June 13, 1990 and November 9, 1993 rules. The listed maximum loads have been determined according to the respective CIP/SAAMI maximum pressure specification, whichever is lower.

These test methods have been deemed to be safe throughout the world. Pressure is measured at the case mouth or from inside the case according to the CIP.

DO NOT ATTEMPT ANY EXTRAPOLATIONS. PLEASE FOLLOW THE DATA AS WRITTEN.

II. IT IS A MUST FOR EVERY RELOADER TO READ THE RELOADING SAFETY RULES ON THE PAGES 9 AND 10 OF THIS GUIDE.

.17 Remington

Test barrel: 22", 1 in 16" twist
Primers: Small Rifle
Cases: Remington, trim-to length 1.787"

Bullet				Powder	Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]
25	HP	Remington	2.145	N135	22.8	4040

.22 Hornet

Test barrel: 23½", 1 in 16" twist
Primers: Small Rifle
Cases: Sako, trim-to length 1.394"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
40	Spire Point	Speer	1.713	N110	7.8	2296	9.5	2586
45	Spitzer	Speer	1.713	N110	7.2	2107	8.8	2371
50	Spitzer	Speer	1.713	N110	7.1	1962	8.3	2203
				N120	9.3	1961	10.7	2237
55	Spitzer	Speer	1.713	N110	6.2	1809	7.7	2046
				N120	8.8	1840	10.3	2142

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.222 Remington

Test barrel: 23", 1 in 14" twist
 Primers: Small Rifle
 Cases: LAPUA, trim-to length 1.693"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
40	Spire Point	Speer	2.087	N110	14.3	2974	16.2	3207
	Hornet	Sierra	2.047	N120	20.1	3251	20.8	3373
	Spire Point	Speer	2.047	N120	19.9	3193	21.3	3449
				N130	21.6	3191	23.2	3435
				N133	22.9	3229	25.2	3517
45	Spitzer	Speer	2.087	N110	13.6	2781	15.4	3008
	Hornet	Hornady	2.110	N120	19.3	3035	20.7	3257
				N130	21.8	3120	23.2	3340
				N133	22.7	3094	24.2	3331
50	Spitzer	Speer	2.087	N120	18.7	2873	20.0	3090
	SXSP	Hornady	2.118	N130	20.5	2918	22.1	3142
				N133	22.2	2969	24.0	3215
				N135	21.6	2725	23.5	3024
55	SP	Sako	2.134	N120	18.0	2736	19.6	2956
	FMJBT	Hornady	2.118	N130	20.0	2803	21.4	3025
				N133	21.7	2857	23.4	3066
				N135	22.6	2840	23.3	2949
60	HP	Hornady	2.126	N120	17.1	2556	18.9	2789
				N130	19.2	2640	21.1	2877
				N133	20.8	2690	22.6	2928
				N135	21.6	2744	23.5	2847
69	HPBT	Sierra*	2.126	N130	18.1	2456	19.5	2641
				N133	19.5	2519	21.0	2690
				N135	20.2	2533	22.1	2728
				N140	22.2	2554	23.7	2748

.223 Remington

Test barrel: 25", 1 in 12" twist
 Primers: Small Rifle
 Cases: LAPUA, trim-to length 1.752"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
40	Spire Point	Speer	2.075	N120	22.4	3373	24.0	3640
				N130	24.4	3399	26.3	3685
				N133	25.0	3347	26.8	3615
45	Spitzer	Speer	2.126	N120	21.7	3187	23.5	3463
				N130	23.5	3235	25.6	3511
				N133	24.9	3245	27.0	3565
				N135	25.5	3185	26.9	3396

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.223 Remington (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
50	"TNT"-HP	Speer	2.244	N120	21.2	3048	23.2	3314
				N130	23.0	3097	24.9	3368
				N133	24.6	3113	26.2	3398
				N135	25.0	3077	26.5	3333
52	HPBT	Sierra	2.244	N130	21.5	2959	24.0	3274
				N133	23.5	3003	25.8	3315
				N135	24.3	3014	27.0	3333
				N120	19.6	2820	22.5	3134
55	FMJBT	Hornady	2.244	N130	22.1	2931	24.1	3217
				N133	22.9	2927	25.3	3231
				N135	24.3	2983	26.8	3267
				N140	25.3	2881	26.9	3081
60	HP	Hornady	2.244	N130	21.4	2796	23.7	3063
				N133	22.4	2772	25.0	3076
				N135	23.9	2860	25.9	3075
				N140	24.8	2758	26.5	2954
69	HPBT	Sierra*	2.244	N133	20.5	2565	23.0	2828
				N135	22.3	2595	24.7	2890
				N140	23.6	2633	26.4	2922
				N540	24.9	2679	27.3	2984
69	Scenar	LAPUA*	2.260	N135	21.6	2779	23.0	2969
				N140	22.8	2740	25.2	3009
				N540	24.1	2881	26.2	3179
				N135	20.9	2465	23.5	2728
75	BTHP	Hornady*	2.260	N140	22.7	2475	25.3	2774
				N540	23.5	2515	25.9	2807

.22 PPC - USA

Test barrel: 24", 1 in 14" twist

Primers: Small Rifle

Cases: Sako, trim-to-length 1.508"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
52	HPBT	Sierra	2.024	N120	21.9	3171	22.7	3254
				N130	21.8	3027	24.3	3335
				N133	23.1	3086	25.8	3386
				N135	25.1	3130	27.8	3443
55	Spitzer	Speer	2.039	N130	21.8	2946	24.3	3202
				N133	22.8	2996	25.4	3232
				N135	25.5	3091	28.3	3435

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.22-250 Remington

Test barrel: 22", 1 in 14" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 1.902"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
45	Spitzer	Speer	2.319	N130	30.2	3580	33.3	3884
				N135	33.4	3564	36.2	3885
				N140	35.3	3576	38.7	3941
50	Spitzer	Speer	2.346	N130	26.4	3070	33.0	3522
				N135	29.4	3161	36.0	3579
				N140	31.3	3133	36.3	3588
55	Spitzer	Speer	2.346	N150	32.1	3135	37.3	3584
				N135	30.0	3145	33.3	3460
				N140	32.8	3185	35.8	3483
60	HP	Hornady	2.346	N150	33.7	3189	37.3	3521
				N140	30.8	2994	34.3	3314
				N150	31.2	2977	35.4	3318
69	HPBT	Sierra*	2.346	N140	27.2	2649	33.7	3134
				N540	28.4	2729	34.6	3225
				N150	28.4	2697	34.9	3157
				N550	30.8	2794	37.2	3305
				N160	35.4	2747	41.3	3239
				N560	34.4	2748	42.9	3310

.220 Swift

Test barrel: 24", 1 in 14" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 2.196"

Bullet				Powder	Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]		Velocity [fps]
50	FMJ	Sako	2.677	N140	38.6		3900
55	SP	Sako	2.677	N140	37.0		3250
55	SP	Norma	2.677	N160	43.1		3710

6 PPC -USA

Test barrel: 23", 1 in 14" twist
 Primers: Small Rifle
 Cases: Sako, trim-to length 1.508"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
68	HPFB	EUBER	2.110	N130	23.4	2761	25.9	3040
				N133	25.1	2752	28.1	3113
70	HPBT	Sierra	2.110	N120	21.5	2653	23.9	2956
				N130	22.6	2686	26.0	3058
				N133	24.5	2705	27.6	3063

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6mm BR Norma

Test barrel: 25½", 1 in 8" twist
 Primers: Small Rifle
 Cases: LAPUA, trim-to length 1.508"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
70	HPBT	Sierra	2.087	N133	23.7	2694	29.2	3104
				N135	26.7	2795	33.2	3271
77	SilverJacket Scenar	LAPUA	2.362	N133	28.5	2894	31.0	3156
				N140	31.7	2946	33.9	3215
90	FMJ	LAPUA	2.347	N540	33.1	2992	35.6	3271
				N140	23.3	2372	29.2	2808
90	SilverJacket Scenar	LAPUA	2.362	N540	24.3	2333	32.6	3012
				N135	28.6	2717	31.5	2966
100	Mega	LAPUA	2.177	N140	30.2	2772	32.7	3018
				N540	31.2	2795	33.9	3064
105	Scenar	LAPUA	2.347	N140	23.6	2247	28.4	2641
				N540	24.5	2244	29.8	2717
105	SilverJacket Scenar	LAPUA	2.362	N140	28.2	2497	31.1	2759
				N150	28.5	2516	31.6	2753
				N540	29.0	2543	32.2	2818

.243 Winchester

Test barrel: 23", 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.039"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
70	SXSP	Hornady	2.638	N133	33.4	3084	36.8	3219
				N135	36.4	2957	40.5	3310
				N140	38.7	3003	43.2	3389
				N150	39.7	3019	44.1	3384
				N160	46.1	3004	51.3	3451
80	FMJ	Hornady	2.638	N135	33.6	2837	37.0	3044
				N140	35.6	2856	39.4	3092
				N150	35.0	2876	38.9	3068
				N160	43.6	2869	48.6	3222

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.243 Winchester (cont'd)

Test barrel: 23", 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.039"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
87	HPBT	Hornady	2.677	N140	34.2	2738	38.3	2974
				N150	33.7	2757	37.9	2947
				N160	41.9	2744	46.6	3084
				N560	43.2	2890	48.0	3149
90	FMJ	LAPUA	2.689	N150	23.3	2346	32.8	2907
				N550	30.6	2595	39.0	3146
				N160	31.1	2605	40.9	3127
95	X	Barnes	2.709	N560	27.5	2171	37.6	2727
100	SPBT	Hornady	2.650	N160	40.8	2615	45.3	2903
				N560	41.3	2697	45.7	2962
				N165	44.0	2647	49.3	2932
100	Mega	LAPUA	2.689	N150	23.6	2274	32.4	2868
				N550	32.8	2566	42.0	3199
				N160	35.9	2654	42.8	3084
105	Spitzer	Speer	2.670	N160	35.2	2440	39.2	2634
105	Scenar	LAPUA	2.689*	N560	35.2	2486	38.8	2719
				N550	34.6	2579	40.4	2923
				N160	36.4	2579	42.8	2936
*) Test barrel twist 1 to 8".				N165	42.2	2635	48.5	3012

6mm Remington

Test barrel: 22½", 1 in 9" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 2.224"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
70	HPBT	Sierra	2.811	N135	36.6	3096	40.4	3321
				N140	39.6	3148	43.3	3400
				N150	39.1	3145	43.4	3376
				N160	47.3	3121	52.4	3520
80	FMJ	Hornady	2.815	N135	32.7	2794	35.9	2967
				N140	35.5	2918	39.2	3087
				N150	34.2	2850	37.9	3035
87	SP	Hornady	2.815	N160	44.1	3032	48.9	3245
				N140	34.5	2744	38.0	2916
				N150	33.9	2742	37.3	2894
100	SPBT	Hornady	2.815	N160	44.4	2876	49.1	3141
				N165	47.5	2951	52.7	3110
				N160	41.7	2729	45.8	2927
105	Spitzer	Speer	2.815	N165	43.4	2745	48.1	2940
				N165	42.3	2726	46.5	2888

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.240 Weatherby Magnum

Test barrel: 23½", 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: Norma, trim-to length 2.222"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
75	HPFB	Hornady	3.075	N150	42.1	3081	49.3	3569
				N550	46.6	3177	52.7	3684
				N160	48.9	3115	54.7	3628
77	HPFB	LAPUA	3.075	N150	43.0	3058	49.1	3548
				N550	46.7	3138	52.3	3628
				N160	48.9	3112	54.5	3591
90	Scenar	LAPUA	3.075	N550	42.3	2889	50.2	3361
				N160	46.0	2882	53.1	3364
				N165	50.1	2902	57.7	3420
100	Mega	LAPUA	3.075	N550	42.1	2751	49.2	3205
				N160	44.1	2775	50.8	3166
				N165	49.1	2765	56.1	3264
105	Spitzer	Speer	3.063	N160	38.9	2575	49.4	3106
				N560	46.3	2767	54.0	3192
				N165	47.5	2746	55.8	3215

.25-06 Remington

Test barrel: 23", 1 in 10" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 2.484"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
87	SPBT	Speer	3.122	N140	32.6	2709	42.1	3145
				N150	35.1	2755	44.7	3207
				N160	45.0	2904	54.6	3338
100	SPBT	Speer	3.197	N165	50.4	2977	60.7	3433
				N140	38.4	2768	44.5	3033
				N150	39.7	2809	45.8	3051
120	Spitzer	Speer	3.157	N160	48.8	2888	54.8	3170
				N560	45.0	2780	55.2	3240
				N165	51.1	2915	58.6	3212
120	HPBT	Sierra	3.150	N170	50.2	2727	62.3	3192
				N150	26.7	2106	35.6	2539
				N160	34.6	2328	45.2	2762
120	HPBT	Sierra	3.150	N560	39.4	2440	49.8	2912
				N165	37.5	2399	48.1	2790
				N170	45.1	2491	55.2	2859
120	HPBT	Sierra	3.150	N160	39.3	2443	47.6	2852
				N560	42.1	2522	51.3	2955
				N165	43.6	2540	52.0	2911
120	HPBT	Sierra	3.150	N170	47.6	2513	58.6	2958

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 x 55 Swedish Mauser

Test barrel: 26 $\frac{1}{2}$ ", 1 in 8 $\frac{1}{2}$ " twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.157"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
77	SP	Norma	2.620	N133			42.4	3380
				N135			44.1	3380
				N140			45.1	3400
				N140			44.4	3280
				N150	43.9	3002	46.1	3252
				N140	40.0	2748	42.3	2916
				N540	39.7	2696	43.4	2971
				N150	40.6	2727	43.4	2920
				N550	42.6	2784	46.0	3051
				N160	47.3	2785	50.6	3001
100	FMJ	LAPUA	2.756	N160	46.1	2748	51.0	3024
				N140	36.6	2524	39.8	2780
				N540	37.5	2611	40.8	2870
				N150	39.5	2724	42.1	2890
				N550	41.0	2720	44.4	2993
				N160	47.0	2785	49.3	2963
				N560	48.1	2774	51.6	3012
				N165	48.7	2823	51.2	3000
				N140	37.3	2697	41.7	2946
				N540	38.9	2707	43.1	3018
108	Scenar	LAPUA	3.149	N150	38.4	2680	43.4	2976
				N140	34.8	2346	39.4	2619
				N540	36.6	2470	40.6	2726
				N150	36.3	2389	40.5	2648
				N550	39.5	2544	43.4	2830
				N160	44.7	2607	48.4	2823
				N560	46.8	2599	49.3	2801
				N140	34.7	2292	40.3	2657
				N540	36.6	2305	41.8	2680
				N150	36.2	2321	41.7	2709
123	SilverJacket Scenar	LAPUA	3.150	N150	37.1	2553	41.3	2782
				N550	37.2	2513	43.5	2887
				N160	42.4	2592	45.1	2756
				N140	33.7	2286	38.0	2537
130	HPBT	Norma	3.150	N540	34.5	2353	38.8	2602
				N150	33.7	2263	38.6	2526
				N550	37.9	2401	42.2	2684
				N160	41.7	2391	46.1	2654
				N560	45.3	2523	49.3	2784

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 x 55 Swedish Mauser (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
139	Scenar	LAPUA	3.126	N150	31.9	2100	36.9	2357
				N550	36.7	2269	40.0	2510
				N160	41.1	2359	44.4	2570
				N560	43.1	2409	46.8	2648
				N165	44.4	2395	48.5	2628
139	SilverJacket Scenar	LAPUA	3.149	N550	36.6	2329	41.3	2697
				N160	39.2	2448	44.4	2648
				N560	42.1	2408	47.8	2746
139	HPBT	Norma	3.071	N150	33.8	2182	38.4	2457
				N550	37.8	2346	41.0	2582
				N160	40.9	2320	44.8	2566
				N560	43.1	2349	47.8	2664
				N165	45.2	2408	49.1	2644
140	HPBT	Sierra	3.091	N150	33.1	2173	37.8	2413
				N550	37.1	2292	40.7	2540
				N160	42.2	2392	45.6	2602
				N560	44.1	2450	47.5	2677
				N165	45.0	2408	49.0	2641
144	FMJBT	LAPUA	79.0	N150	32.1	2198	34.6	2339
				N160	41.4	2385	44.1	2523
				N560	43.2	2379	47.5	2648
				N165	42.4	2398	46.0	2543
				N170	46.0	2228	51.1	2526
155	HPBT	Sierra	3.110	N150	31.2	2047	35.0	2246
				N550	35.2	2160	39.2	2386
				N160	39.1	2186	43.5	2429
				N560	39.7	2187	44.0	2452
				N165	40.9	2151	46.1	2417
155	Mega	LAPUA	2.874	N170	42.7	2086	49.3	2425
				N560	40.3	2167	46.3	2454
				N165	40.5	2150	47.0	2405
160	RN	Hornady	3.035	N140			36.9	2350
				N160			44.9	2510

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 - .284 Norma

Test barrel: ", 1 in " twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.165"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
108	Scenar	LAPUA	3.110	N160	50.9	3081	54.9	3255
				N560	56.0	3087	59.4	3271
108	SilverJacket Scenar	LAPUA	3.110	N165	57.1	3068	60.2	3222
				N550	47.5	2989	52.5	3241
				N160	51.1	3061	56.2	3284
123	Scenar	LAPUA	3.110	N560	55.7	2992	59.7	3196
				N160	43.2	2664	52.5	3012
				N560	52.8	2858	55.1	3091
123	SilverJacket Scenar	LAPUA	3.110	N165	48.5	2782	57.7	3054
				N160	46.0	2717	52.9	3022
				N560	54.6	2890	58.5	3159
139	Scenar	LAPUA	3.110	N165	55.7	2782	59.9	3104
				N160	44.3	2638	47.4	2795
				N560	50.6	2789	54.0	2927
139	SilverJacket	LAPUA	3.110	N165	44.6	2595	50.3	2779
				N160	42.9	2546	50.5	2805
				N560	51.1	2667	55.1	2956
				N165	48.1	2618	56.8	2890

.264 Winchester Magnum

Test barrel: 24", 1 in 9" twist
 Primers: Large Rifle Magnum
 Cases: Remington, trim-to length 2.492"

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
85	HP	Sierra	3.098	N140	53.5	3277	57.4	3540
				N160	62.5	3420	67.1	3770
140	FMJ	Hornady	3.255	N140	43.5	2862	47.8	3020
				N160	53.5	2771	57.1	2990
140	HPBT	Sierra	3.339	N160	46.5	2529	54.7	2815
				N560	48.3	2589	57.4	2913
160	FMJ	Norma	3.255	N160	52.0	2618	56.3	2690

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.270 Winchester

Test barrel: 24 $\frac{1}{2}$ ", 1 in 10" twist
Primers: Large Rifle
Cases: Remington, trim-to length 2.531"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	Spitzer	Speer	3.150	N150	45.5	2986	49.8	3150
				N160	56.8	3040	63.1	3340
		Remington	3.228	N165	58.2	3023	64.8	3297
				N160	51.6	2778	55.5	2969
130	SP	Remington	3.228	N560	54.9	2808	59.7	3034
				N165	53.8	2751	59.3	2975
130	SPBT	Speer	3.268	N160	44.1	2397	49.4	2604
150	Spitzer	Speer	3.228	N560	50.9	2634	55.5	2808
150	SP	Remington	3.228	N165	47.9	2461	53.2	2650
				N160	46.6	2436	51.0	2607
160	Partition	Nosler	3.331	N165	47.8	2452	53.1	2634

.270 Weatherby Magnum

Test barrel: 25 $\frac{1}{2}$ ", 1 in 12" twist
Primers: Large Rifle Magnum
Cases: Remington, trim-to length 2.535"

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	PSP	Remington	3.110	N550	64.7	3300	72.4	3722
				N160	69.4	3343	75.4	3681
				N165	76.6	3343	83.7	3708
				N160	64.5	3251	71.7	3315
130	PSPCL	Remington	3.236	N165	69.3	2961	76.6	3302
				N560	71.0	3027	77.5	3322
				N160	63.6	2866	68.8	3186
135	HPBT	Sierra	3.268	N165	69.3	2925	72.8	3265
				N560	69.9	3047	74.6	3341
				N560	66.2	2867	71.5	3150
150	Partition	Nosler	3.250	N165	64.9	2781	73.0	3124
				N170	71.2	2797	79.7	3157

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7mm-08 Remington

Test barrel: 24", 1 in 9½" twist
Primers: Large Rifle
Cases: Remington, trim-to length 2.028"

Bullet			Powder	Starting Load		Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	Hornady	2.717	N130	37.1	2854	40.8	3100
				N133	39.0	2908	43.2	3132
				N135	41.4	2878	45.6	3184
				N140	42.4	2849	47.2	3186
				N150	44.4	2918	49.4	3222
120	Spitzer	Sierra	2.740	N135	38.7	2619	42.7	2893
				N140	41.1	2648	45.4	2941
				N150	42.2	2684	46.9	2967
140	Ballistic Tip	Nosler	2.740	N135	35.5	2319	39.1	2564
				N140	38.5	2407	42.7	2657
				N150	39.2	2419	43.6	2652
160	SPBT	Sierra	2.795	N140	36.5	2263	40.3	2472
				N150	36.8	2266	40.7	2449
				N160	45.8	2421	50.2	2667
168	HPBT	Sierra	2.795	N150	35.0	2199	39.1	2399
				N550	37.4	2283	42.0	2534
				N160	42.9	2295	47.0	2507
175	Mag-Tip	Speer	2.795	N140	32.8	2017	36.2	2195
				N150	32.0	1953	35.2	2123
				N160	39.4	2099	43.1	2298

7 x 57

Test barrel: 22", 1 in 9 $\frac{1}{2}$ " twist
Primers: Large Rifle
Cases: Sako, trim-to length 2.236

Bullet			Powder	Starting Load		Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
120	Spitzer	Sierra	3.012	N135	39.4	2546	43.4	2826
				N140	42.0	2601	46.1	2873
				N150	42.4	2620	46.6	2880
140	Ballistic Tip	Nosler	3.051	N140	38.2	2322	42.5	2568
				N150	39.8	2391	43.6	2599
160	SPBT	Sierra	3.051	N150	37.5	2207	41.4	2414
				N160	45.1	2255	49.4	2539
175	Mag-Tip	Speer	3.031	N160	40.6	2068	45.9	2319
				N165	44.6	2147	49.5	2357

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7mm Remington Magnum

Test barrel: 24", 1 in 9" twist
 Primers: Large Rifle Magnum
 Cases: LAPUA, trim-to length 2.492"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	Hornady	3.189	N160	68.5	3263	75.0	3570
				N560	66.0	3121	77.1	3536
120	Spitzer	Sierra	3.268	N160	65.1	3006	71.5	3295
				N165	69.2	2984	76.3	3298
				N560	62.9	2944	73.4	3312
145	SPBT	Speer	3.268	N160	56.2	2655	62.6	2901
				N560	58.6	2788	65.2	3054
				N165	61.4	2712	67.7	2960
160	Grand Slam	Speer	3.228	N160	51.3	2465	56.3	2645
				N560	53.0	2605	58.8	2821
				N165	55.1	2517	60.7	2707
160	Spitzer	Sierra	3.228	N160	52.6	2433	60.1	2710
				N165	41.5	2139	60.8	2693
				N560	49.3	2411	64.1	2843
168	HPBT	Sierra	3.287	N560	54.9	2468	63.7	2788
				N165	55.0	2423	64.8	2691
				N170	61.8	2434	69.9	2709
175	SBT	Sierra	3.287	N165	46.5	2239	58.5	2575
				N560	48.7	2299	58.7	2666
				N170	55.1	2346	66.2	2619

7mm Weatherby Magnum

Test barrel: 26", 1 in 9" twist
 Primers: Large Rifle Magnum
 Cases: Weatherby, trim-to length 2.540"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	Hornady	3.209	N160	71.5	3411	78.5	3763
				N560	74.8	3449	81.7	3832
120	Spitzer	Sierra	3.248	N160	67.9	3155	74.5	3462
				N560	72.2	3220	78.2	3533
				N165	73.6	3200	80.1	3512
160	Spitzer	Sierra	3.248	N160	61.3	2721	67.6	2988
				N560	64.1	2767	69.8	3037
				N165	66.4	2755	72.3	3026
168	HPBT	Sierra	3.209	N160	60.3	2668	65.2	2878
				N560	62.7	2687	68.0	2976
				N165	65.3	2690	69.5	2908

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30 Carbine

Test barrel: 18", 1 in 10" twist
Primers: Small Rifle
Cases: Federal, trim-to length 1.283"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	Plinker	Speer	1.673	N110	13.2	1952	14.5	2121
110	Spire Point	Speer	1.673	N110	11.9	1761	13.3	1908

.30-30 Winchester

Test barrel: 20", 1 in 12" twist
Primers: Large Rifle
Cases: Remington, trim-to length 2.031"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
105	HP	LAPUA	2.539	N130	29.4	2433	32.5	2668
				N133	32.6	2542	36.3	2765
130	FSP	Speer	2.547	N120	24.7	2149	27.6	2344
				N130	27.3	2196	30.5	2420
				N133	29.5	2238	32.8	2467
150	FSP	Speer	2.539	N135	31.1	2242	34.6	2455
				N120	21.9	1824	24.2	1985
				N130	24.7	1911	27.5	2103
				N133	25.7	1935	28.6	2115
				N135	29.4	2000	32.4	2193
170	FSP	Speer	2.539	N140	31.5	2011	34.7	2240
				N130	23.8	1813	26.3	1974
				N133	25.2	1799	27.6	1948
				N135	27.0	1825	30.1	2015
				N140	28.2	1803	31.7	2025

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.300 Savage

Test barrel: 23¹/₂", 1 in 12" twist
Primers: Large Rifle
Cases: Remington, trim-to length 1.862"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	LAPUA	2.461	N120	32.9	2829	37.7	3232
				N130	36.5	2962	40.0	3268
				N133	38.9	2897	44.0	3225
125	TNT-HP	Speer	2.579	N120	31.0	2444	35.1	2744
				N130	33.3	2546	37.4	2830
				N133	38.4	2645	41.8	2900
150	Mega	LAPUA	2.421	N130	28.1	2182	33.7	2460
				N135	33.7	2255	38.5	2529
				N140	36.5	2294	42.0	2598
165	SBT	Sierra	2.598	N133	33.0	2198	37.3	2481
				N135	35.5	2267	39.0	2498
				N140	37.0	2270	41.4	2574
200	Mega	LAPUA	2.598	N135	32.1	2004	37.6	2308
				N140	34.5	2071	40.0	2342
				N540	35.2	2044	41.0	2358

.308 Winchester

Test barrel: 24", 1 in 12" twist
Primers: Large Rifle
Cases: LAPUA, trim-to length 2.008"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
57	ALS*)	LAPUA	2.638	N110	22.4	2989	33.9	3927
				N120	32.4	2789	35.9	3052
				N130	36.1	2920	40.7	3206
100	HP	LAPUA	2.638	N135	41.2	2965	46.8	3290
				N120	36.3	2800	40.0	3069
				N130	39.9	2892	44.1	3145
110	HP	Sako	2.657	N133	43.2	2937	47.6	3210
				N130	35.4	2602	41.1	2923
				N135	42.4	2746	46.0	2953
123	FMJ	LAPUA	2.634					

*) Note: A muzzle velocity exceeding 3300 fps may lead to severe barrel fouling!

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.308 Winchester (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
125	Ballistic Tip	Nosler	2.756	N130	37.9	2742	41.7	2977
				N133	41.1	2782	44.9	3028
				N135	42.8	2796	47.2	3048
				N140	45.3	2804	49.9	3070
150	Mega	LAPUA	2.638	N135	31.7	2162	39.1	2557
				N140	32.2	2126	40.8	2564
				N540	34.9	2185	42.6	2613
150	SPBT	Sierra	2.756	N133	37.8	2526	42.0	2730
				N135	40.4	2558	44.3	2776
				N140	42.3	2546	46.8	2814
				N150	44.2	2576	48.2	2790
150	Lock Base	LAPUA	2.795	N540	42.9	2558	47.3	2835
				Sierra	2.795	N140	40.8	2495
150	HPBT			N540	42.1	2478	46.9	2821
				N150	42.5	2526	47.0	2767
				N550	44.8	2523	49.7	2796
				N135	34.4	2230	40.7	2615
155	Scenar	LAPUA	2.795	N140	36.7	2227	43.3	2624
				N150	39.0	2335	46.8	2680
				N140	41.1	2497	46.3	2799
155	SilverJacket Scenar	LAPUA	2.795	N150	41.9	2536	46.9	2815
				N540	41.7	2543	47.0	2848
				N135	37.1	2413	41.4	2645
155	HPBT	Sierra	2.795	N140	39.3	2435	44.2	2682
				N540	40.2	2437	45.2	2722
				N150	42.6	2540	46.6	2760
				N550	44.9	2578	49.8	2859
				N135	39.2	2418	43.1	2668
156	SPBT	Sako	2.685	N140	41.1	2416	45.4	2695
				N150	43.6	2509	48.3	2771
				N133	37.1	2369	40.7	2583
165	SPBT	Speer	2.795	N135	38.8	2401	42.7	2627
				N140	40.6	2419	44.9	2666
				N150	41.6	2437	46.3	2681
				N550	44.3	2473	48.2	2694
				N140	40.0	2358	44.0	2604
167	Scenar	LAPUA	2.795	N540	39.8	2381	43.9	2637
				N150	41.9	2428	46.1	2657
				N550	44.4	2480	48.9	2719

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.308 Winchester (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
167	Silver Jacket Scenar	LAPUA	2.795	N140	40.9	2474	44.7	2710
				N150	41.5	2457	45.8	2710
168	HPBT	Sierra	2.795	N540	41.4	2448	46.3	2740
				N140	38.3	2313	42.9	2558
				N540	39.9	2357	44.6	2626
170	FMJBT	LAPUA	2.795	N150	40.5	2390	44.5	2607
				N550	43.4	2461	47.3	2701
				N135	37.9	2351	41.6	2572
				N140	39.9	2371	44.1	2614
				N540	40.6	2343	44.8	2656
				N150	41.3	2419	45.9	2647
175	HPBT	Sierra	2.795	N550	43.4	2401	48.5	2772
				N140*	37.3	2247	41.4	2473
				N540*	39.4	2326	43.1	2557
				N150*	39.0	2313	43.7	2546
				N550*	41.7	2368	45.8	2604
180	SP	Hornady	2.795	N135	36.3	2196	40.4	2430
				N140	38.5	2225	42.8	2477
				N150	40.4	2324	44.5	2514
180	X	Barnes	2.795	N540	34.7	2074	39.5	2353
				N550	37.9	2163	42.6	2417
185	FMJBT	LAPUA	2.795	N135	36.0	2189	39.9	2425
				N140	38.2	2241	42.2	2474
				N540	39.5	2316	42.8	2509
185	Scenar	LAPUA	2.795	N150	39.2	2263	43.5	2460
				N550	42.3	2303	46.4	2536
185	Silver Jacket Scenar	LAPUA	2.795	N140	38.8	2297	42.8	2539
				N150	39.1	2320	44.0	2559
				N550	42.8	2303	47.2	2654
185	Forex	LAPUA	2.732	N540	36.0	2074	42.0	2408
				N150	35.6	2063	43.3	2433
				N550	39.0	2109	46.0	2499
190	HPBT	Sierra	2.795	N140	37.5	2199	41.6	2414
				N540	37.9	2188	42.4	2467
				N150	38.6	2195	42.5	2420
				N550	40.9	2265	45.6	2517
200	SP	Speer	2.795	N140	36.0	2052	39.9	2256
				N150	36.9	2092	40.4	2259

*) These loads have been tested with 175 gr. Berger VLD's, too.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7.62 x 54R (7.62 Russian)

Test barrel: 26", 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.098"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
123	FMJ	LAPUA	2.697	N130	41.9	2831	46.8	3059
				N133	46.2	2893	50.4	3103
				N135	46.9	2829	51.9	3116
150	Mega	LAPUA	2.626	N133	32.3	2110	43.0	2667
				N135	37.9	2284	46.4	2753
				N140	40.6	2329	48.5	2792
155	Scenar	LAPUA	2.972	N135	39.2	2382	46.2	2795
				N140	42.2	2451	48.7	2854
				N150	44.5	2526	50.6	2861
156	SPBT	Sako	2.776	N135	42.6	2471	47.2	2736
				N140	44.2	2485	49.2	2773
				N150	46.6	2529	51.4	2810
167	Scenar	LAPUA	2.953	N540	42.3	2333	48.1	2663
				N140	44.5	2469	49.1	2722
				N150	45.8	2443	50.5	2736
168	HPBT	Sierra	2.976	N550	46.2	2393	52.5	2756
				N140	42.5	2347	48.2	2653
				N540	43.6	2370	49.7	2710
185	Scenar	LAPUA	2.953	N150	44.8	2395	50.0	2701
				N550	47.4	2431	53.3	2773
				N135	40.0	2252	44.5	2516
185	Mega	LAPUA	2.756	N540	40.9	2226	46.4	2534
				N140	41.8	2290	46.8	2568
				N150	43.5	2294	48.2	2575
185	Forex	LAPUA	2.815	N550	44.2	2275	50.5	2632
				N140	39.9	2120	46.1	2445
				N540	41.4	2160	47.2	2484
185				N150	42.3	2160	47.6	2466
				N550	45.2	2224	51.3	2587
				N140	38.3	2215	45.3	2569
				N540	41.3	2339	46.8	2625
				N150	41.3	2306	47.7	2602

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7.62 x 54R (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
200	HPBT	Sierra	3.035	N140	38.6	2083	45.2	2414
				N540	39.2	2107	45.2	2422
				N150	40.4	2118	46.4	2428
				N550	43.8	2187	49.2	2500
200	D166 FMJBT	Lapua	2.992	N140	36.6	2103	40.1	2277
				N150	37.5	2152	40.4	2326
				N540	38.3	2175	40.6	2333
220	HPBT	Sierra	3.035	N540	37.9	1968	42.8	2246
				N150	37.0	1879	43.3	2221
				N550	41.0	2012	46.6	2332

7.5 x 55 GP31 (7.5mm Swiss)

Test barrel: 23½", 1 in 10" twist

Primers: Large Rifle

Cases: Norma, trim-to length 2.179"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
155	Scenar	LAPUA	2.972	N140	48.6	2651	49.8	2749
				N150	49.1	2661	50.9	2769
				N540	49.4	2720	51.1	2877
167	Scenar	LAPUA	2.972	N140	45.5	2477	48.3	2680
				N150	47.1	2533	49.2	2743
				N540	46.5	2913	48.8	2749
185	Scenar	LAPUA	2.972	N140	41.7	2375	46.5	2477
				N150	45.1	2382	46.8	2484
				N540	44.1	2392	47.1	2507

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-06 Springfield

Test barrel: 24", 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.484"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
57 100	ALS*) HP	LAPUA	3.110 3.142	N110	26.5	3110	37.8	3940
				N130	39.7	2846	48.5	3267
				N133	47.4	2986	53.8	3329
				N135	50.1	3036	56.4	3383
				N140	54.0	3034	60.9	3418
				N540	55.3	3076	62.9	3465
105	HP	LAPUA	81.0	N133	46.6	2999	51.2	3242
				N135	49.8	3045	55.1	3314
				N140	53.4	3058	59.1	3363
110	RN	Hornady	2.913	N133	48.6	2863	53.7	3224
				N135	48.5	2834	53.5	3164
				N140	52.1	2890	57.8	3205
				N150	55.1	2969	60.8	3286
				N133	45.5	2704	51.0	3019
123	FMJ	LAPUA	3.142	N135	49.2	2792	53.6	3069
				N140	51.6	2794	57.4	3116
				N540	53.7	2826	58.9	3136
				N150	55.3	2882	60.3	3195
				N135	47.8	2839	52.4	3067
125	Ballistic Tip	Nosler	3.307	N140	51.1	2880	56.1	3142
				N540	53.8	2887	60.3	3262
				N150	53.2	2895	58.7	3169
				N550	57.1	2935	60.4	3116
				N135	40.1	2333	47.7	2740
150	Mega	LAPUA	3.028	N140	43.7	2402	51.2	2812
				N540	45.3	2403	53.5	2930
				N135	45.2	2590	49.9	2790
				N140	48.2	2630	53.2	2861
				N540	48.8	2595	54.6	2887
150	Lock Base	LAPUA	3.307	N150	50.2	2634	55.3	2877
				N550	54.1	2688	59.7	3010
				N140	47.5	2617	52.8	2859
				N540	50.4	2654	56.1	2973
				N150	50.7	2646	56.3	2935
155	Scenar	LAPUA	3.307	N550	54.7	2734	59.7	3006
				N140	42.9	2447	49.8	2789
				N150	43.0	2516	50.9	2831
				N540	47.0	2539	53.2	2907

*) Note: A muzzle velocity exceeding 3300 fps may lead to severe barrel fouling!

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-06 Springfield (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
156	SPBT Scenar	Sako LAPUA	3.169 3.307	N135	45.8	2547	50.8	2793
				N140	47.8	2543	52.7	2818
				N150	49.1	2561	54.5	2831
167				N140	45.5	2418	50.2	2664
				N540	45.4	2413	51.8	2737
				N150	47.2	2455	52.1	2694
				N550	49.6	2556	55.0	2806
				N160	55.5	2455	61.5	2757
170				N140	44.9	2348	49.9	2618
				N540	45.6	2390	51.5	2687
	FMJBT Spitzer X Scenar	LAPUA	3.307	N150	47.2	2409	52.6	2668
				N550	48.8	2443	55.6	2758
				N160	56.2	2506	62.4	2794
180				N160	52.4	2394	57.6	2603
180				N550	48.6	2311	54.5	2596
185				N150	44.4	2280	50.2	2548
				N540	44.1	2255	48.6	2523
				N550	46.5	2295	51.7	2592
				N160	53.7	2370	59.3	2650
				N560	54.3	2373	61.8	2672
185	Forex	LAPUA	3.189	N150	42.2	2234	48.1	2562
				N550	46.7	2369	51.1	2697
				N160	49.7	2415	53.8	2661
190				N150	44.8	2279	49.3	2517
				N550	47.4	2323	53.8	2664
				N160	52.7	2376	58.8	2608
				N560	55.1	2364	62.4	2706
200				N150	43.0	2195	47.5	2374
				N160	52.1	2309	57.6	2510
220				N160	50.7	2144	56.0	2368
				N560	53.5	2206	61.3	2517

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.300 H&H Magnum

Test barrel: 24", 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: Winchester, trim-to length 2.842"

Bullet				Powder	Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]
125	FMJ	Sako	3.484	N160	77.2	3610
150	Spitzer	Speer	3.582	N160	75.2	3120
155	SP	Sako	3.582	N160	72.4	3000
165	Spitzer	Speer	3.590	N160	70.2	2900
180	SP	Sako	3.590	N160	67.9	2870
220	RN	Hornady	3.578	N160	65.1	2540

.308 Norma Magnum

Test barrel: 24", 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: Norma, trim-to length 2.551"

Bullet				Powder	Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]
147	FMJ	Norma	3.346	N160	76.1	3410
155	SP	Sako	3.248	N160	72.8	3100
180	SP	Sako	3.307	N160	70.7	3050
200	SP	Sako	3.307	N160	66.4	2810
220	RN	Hornady	3.358*	N160	65.1	2710

*) The CIP maximum cartridge overall length is exceeded.

.300 Winchester Magnum

Test barrel: 24", 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: LAPUA, trim-to length 2.610"

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
110	SP	Hornady	3.268	N160	76.5	3145	83.3	3489
150	Ballistic Tip	Nosler	3.339	N160	69.0	2789	76.3	3097
				N165	75.3	2898	83.2	3197
155	Scenar	LAPUA	3.339	N160	63.7	2733	71.8	3143
				N560	69.1	2785	77.2	3179
				N165	72.4	2813	80.2	3189
167	Scenar	LAPUA	3.339	N160	68.9	2724	74.5	2987
				N165	73.4	2751	80.0	3032

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.300 Winchester Magnum (cont'd)

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
180	Partition	Nosler	3.339	N160	65.2	2596	72.5	2867
				N165	70.8	2626	77.6	2898
185	Forex	LAPUA	3.307	N560	63.7	2546	72.7	2927
				N165	64.0	2530	75.8	2959
				N170	69.5	2497	80.6	2877
190	HPBT	Sierra	3.339	N560	66.4	2688	74.6	2929
				N165	68.8	2663	76.6	2876
				N170	67.3	2572	77.3	2808
200	HPBT	Sierra	3.339	N160	61.6	2482	69.8	2720
				N560	60.3	2511	70.1	2774
				N165	63.4	2503	73.1	2753
220	HPBT	Sierra	3.339	N170	61.7	2420	73.8	2694
				N560	51.8	2261	62.8	2543
				N165	49.6	2165	64.2	2503
				N170	55.7	2239	65.6	2496

.300 Weatherby Magnum

Test barrel: 26", 1 in 10" twist

Primers: Large Rifle Magnum

Cases: Weatherby, trim-to length 2.815"

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
125	Ballistic Tip	Nosler	3.543	N160	80.3	3179	88.8	3612
				N165	75.7	2936	83.6	3282
150	Ballistic Tip	Nosler	3.547	N160	82.0	2967	90.8	3300
				N165	74.8	2818	82.9	3193
165	SPBT	Speer	3.555	N160	80.9	2823	89.6	3216
				N165	72.7	2735	80.0	3038
180	SP	Hornady	3.555	N160	78.6	2756	86.7	3079
				N165	72.6	2694	79.8	2961
200	HPBT	Sierra	3.555	N560	70.7	2612	80.8	2914
				N165	70.9	2566	85.0	2918
				N170				

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.300 LAPUA Magnum

Test barrel: 27", 1 in 9½" twist
 Primers: Large Rifle Magnum
 Cases: LAPUA, trim-to length 2.715"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
155	Scenar	LAPUA	3.661	N160	75.4	3182	81.6	3386
				N560	80.9	3182	89.7	3504
170	LockBase	LAPUA	3.661	N170	92.8	3248	100.0	3520
				N560	78.9	3077	85.7	3314
185	Scenar	LAPUA	3.661	N170	83.3	2917	92.1	3182
				24N41	94.8	3087	102.3	3356
200	HPBT	Sierra	3.661	N560	74.4	2871	83.2	3163
				N170	83.3	2917	92.1	3186
220	Sierra	HPBT	3.661	24N41	91.6	2992	98.1	3215
				N170	78.6	2779	87.0	3025
				24N41	85.8	2828	93.9	3064
				20N29	98.7	2912	104.9	3133
				24N41	78.6	2621	88.8	2894
				20N29	93.5	2792	100.6	2992

.300 Remington Ultra Magnum

Test barrel: 25¾", 1 in 11" twist
 Primers: Large Rifle Magnum
 Cases: Remington, trim-to length 2.840"

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
165	Partition	Nosler	3.524	N160	80.2	3015	82.9	3120
				N560	84.1	3009	89.5	3202
180	"X"	Barnes	3.469	N165	87.5	3051	90.9	3192
				N560	74.4	2910	80.7	3018
185	Scenar	LAPUA	3.598	N165	72.4	2815	77.5	2956
				N170	80.6	2858	87.8	2999
				N560	85.3	2992	88.4	2979
				N165	82.6	2953	88.9	3012
				N170	92.6	2946	96.5	3058

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-.378 Weatherby Magnum

Test barrel: 26", 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: Weatherby, trim-to length 2.904"

LOADS LESS THAN LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
155	Scenar	LAPUA	3.661	N160	75.4	3182	81.6	3386
				N560	80.9	3182	89.7	3504
				N170	92.8	3248	100.0	3520
170	LockBase	LAPUA	3.661	N560	78.9	3077	85.7	3314
				N170	83.3	2917	92.1	3182
				24N41	94.8	3087	102.3	3356
185	Scenar	LAPUA	3.661	N560	74.4	2871	83.2	3163
				N170	83.3	2917	92.1	3186
				24N41	91.6	2992	98.1	3215
200	HPBT	Sierra	3.661	N170	78.6	2779	87.0	3025
				24N41	85.8	2828	93.9	3064
				20N29	98.7	2912	104.9	3133
220	Sierra	HPBT	3.661	24N41	78.6	2621	88.8	2894
				20N29	93.5	2792	100.6	2992

7.62 x 39

Test barrel: 16½", 1 in 9½" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 1.515"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
57	FMJ	LAPUA	2.063	N110	20.2	2805	24.7	3123
123	FMJ	Sako	2.293	N120			26.5	2430
123	SP	Sako	2.134	N120			26.7	2360
123	Mega	LAPUA	2.063	N120	22.0	1975	25.7	2306
				N130	24.4	2080	27.3	2359

.303 British

Test barrel: 24", 1 in 10" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 2.212"

Bullet				Powder	Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]		Velocity [fps]
180	SP	Sako	2.897	N140	41.7		2540

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

8mm Mauser (8 x 57 JS)

Test barrel: 24", 1 in 9 $\frac{1}{2}$ " twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.236"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
125	SP	Hornady	2.913	N130	43.2	2867	48.2	3117
				N133	48.5	2898	53.9	3213
				N135	49.6	2894	55.1	3196
150	Spitzer	Speer	2.992	N135	45.9	2628	51.1	2887
				N140	48.3	2621	53.9	2927
				N135	44.1	2455	49.0	2718
170	SP	Speer	3.031	N140	46.1	2452	51.4	2749
				N150	48.4	2497	53.7	2798
				N140	42.8	2170	47.5	2490
200	Spitzer	Speer	3.130	N150	44.1	2230	49.3	2505
				N160	50.5	2235	56.2	2575

.338 Winchester Magnum

Test barrel: 24", 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: LAPUA, trim-to length 2.492"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
200	SP	Hornady	3.346*	N160	72.8	2631	80.8	2969
				N160	64.9	2423	72.9	2707
				N560	68.0	2448	76.8	2766
225	SP	Hornady	3.307	N550	59.6	2343	65.5	2625
				N160	60.5	2300	69.8	2622
				N560	68.1	2379	77.1	2733
250	Scenar	LAPUA	3.307	N160	60.9	2299	68.2	2541
				N560	61.6	2300	70.5	2599
				N165	65.6	2329	74.5	2613
250	SBT	Sierra	3.339	N160	64.5	2300	72.0	2561
				N560	61.6	2300	70.5	2599
				N165	65.6	2329	74.5	2613
250	Grand Slam	Speer	3.299	N160	64.5	2300	72.0	2561
				N165	69.4	2357	77.2	2604
				N160	59.9	2260	71.4	2635
260	Forex	LAPUA	3.350*	N560	67.9	2346	78.1	2703
				N165	71.4	2398	80.2	2674
				N165	67.1	2265	74.4	2488
275	SP	Speer	3.346*	N160	57.6	2076	65.4	2321
				N560	59.3	2107	68.0	2357

*) The SAAMI maximum cartridge overall length is exceeded.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.338 LAPUA Magnum

Test barrel: 27½", 1 in 10" twist
Primers: Large Rifle Magnum
Cases: LAPUA, trim-to length 2.714"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
200	SP	Hornady	3.583	N160	85.1	2882	94.7	3211
				N165	91.7	2904	101.4	3248
225	SP	Hornady	3.583	N160	74.3	2619	89.3	3015
				N560	81.3	2800	92.6	3124
250	Scenar	LAPUA	3.681	N165	79.0	2642	95.4	3065
				N170	87.4	2744	100.0	3070
250	Lock Base	Lapua	3.602	N560	71.1	2514	85.0	2891
				N165	72.3	2484	85.9	2816
250	Lock Base	Lapua	3.602	N170	85.1	2599	97.1	2911
				N560	76.8	2627	88.0	2941
260	Forex	LAPUA	3.583	N165	73.2	2520	89.2	2871
				N170	78.4	2539	93.8	2878
260	Forex	LAPUA	3.583	N560	74.7	2534	86.2	2907
				N165	74.6	2531	85.9	2897
300	HPBT	Sierra	3.602	N170	84.8	2603	96.4	2939
				N165	66.2	2175	82.8	2575
300	HPBT	Sierra	3.602	N560	67.8	2254	85.6	2693
				N170	74.4	2251	93.3	2663
300	HPBT	Sierra	3.602	24N41	79.9	2302	97.7	2671

.358 Norma Magnum

Test barrel: 24", 1 in 12" twist
Primers: Large Rifle Magnum
Cases: Norma, trim-to length 2.512"

Bullet				Powder	Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]
250	SP	Norma	3.228	N160	80.2	2790

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

9.3 x 62

Test barrel: 24", 1 in 14" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 2.433"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
258	HKM	RWS	3.216	N135			57.6	2510
270	Forex	LAPUA	3.173	N135	45.4	1932	54.3	2297
				N140	46.0	2024	55.7	2329
				N150	52.5	2096	60.4	2395
285	TMR	RWS	3.232	N135			54.5	2330

9.3 x 64

Test barrel: 25½", 1 in 14" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 2.512"

Bullet				Powder	Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]
258	HKM	RWS	3.366	N140	67.9	2670
285	TMR	RWS	3.326	N140	67.0	2530
293	TUG	RWS	3.366	N160	75.9	2550

.375 H&H Magnum

Test barrel: 24", 1 in 12" twist
 Primers: Large Rifle Magnum
 Cases: Remington, trim-to length 2.842"

Bullet				Powder	Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]
235	Spitzer	Speer	3.582	N140	76.4	2890
				N160	86.7	2900
270	RN	Hornady	3.602*	N140	73.3	2760
				N160	84.1	2790
300	RN	Hornady	3.563	N140	69.6	2530
				N160	81.8	2560

*) The SAAMI maximum cartridge overall length is exceeded.

NOTE!

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.444 Marlin

Test barrel: 22", 1 in 38" twist
Primers: Large Rifle
Cases: Remington, trim-to length 2.216"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
200	HP/XTP	Hornady	2.535	N110	41.1	2381	45.0	2531
				N120	50.2	2551	55.4	2754
240	JTC-SIL	Hornady	2.539	N120	45.4	2261	50.3	2455
				N130	50.7	2315	54.4	2468
265	FP	Hornady	2.559	N120	43.5	2129	48.1	2320
				N130	46.8	2117	51.3	2320

.45-70 Government

Test barrel: 22", 1 in 20" twist
Primers: Large Rifle
Cases: Remington, trim-to length 2.098"

WARNING: These loads are to be used only in modern lever and bolt action rifles manufactured to meet CIP/SAAMI recommendations. They must NOT be used in old rifles with weaker actions like Trapdoor and Marlin mod. 1895. The listed maximum loads do not exceed 28100 psi.

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
300	HP	Hornady	2.539	N120	40.6	1864	45.0	2029
				N130	48.8	1947	52.1	2090
300	HP	Sierra	2.524	N133	58.7	2048	63.2	2242
				N120	38.9	1832	46.5	2047
400	SP	Speer	2.547	N133	57.6	2057	60.0	2187
				N135	58.6	1982	61.7	2134
400	SP	Speer	2.547	N120	31.7	1455	35.8	1604
				N133	46.6	1695	51.4	1854
				N135	46.6	1609	51.6	1783

.458 Winchester Magnum

Test barrel: 25", 1 in 14" twist
Primers: Large Rifle Magnum
Cases: Remington, trim-to length 2.492"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
300	HP	Sierra	2.933	N120	64.7	2427	70.0	2599
				N120	63.5	2288	69.1	2462
350	SP	Speer	3.091	N130	69.0	2373	73.7	2518
				N135	65.5	1930	70.4	2060
				N135	67.5	1920	72.5	2053
500	RN	Hornady	3.327	N140	70.1	1983	74.5	2100

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.50 BMG

Test barrel: 45", 1 in 16 $\frac{1}{2}$ " twist
Primers: CCI 35
Cases: TZZ, trim-to length 3.902"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
647	FMJBT	Speer	5.413	N170	197.0	2584	220.0	2844
				24N41	211.8	2654	223.3	2848
				20N29	237.2	2702	251.5	2942
700	Solid		5.413	24N41	208.1	2611	225.5	2836
				20N29	232.5	2642	250.2	2894
750	A-MAX	Hornady	5.413	N170	186.1	2450	208.3	2683
				24N41	197.5	2468	212.8	2692
				20N29	221.9	2516	240.2	2749
750	Solid		5.413	24N41	201.6	2473	218.7	2728
				20N29	222.2	2521	243.5	2773
800	Solid		5.413	24N41	179.4	2334	193.4	2529
				20N29	215.1	2521	237.4	2722
850	Solid		5.413	24N41	187.7	2314	203.2	2508
				20N29	211.1	2407	231.2	2638

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

HANDGUN RELOADING DATA

DISCLAIMER

I. All of this reloading information has been provided by Nexplo Vihtavuori Oy and Nammo Lapua Oy. The data given here were obtained in laboratory conditions following strictly the CIP (Commission International Permanente) June 13, 1990 and November 9, 1993 rules. The listed maximum loads have been determined according to the respective CIP/SAAMI maximum pressure specification, whichever is lower.

These test methods have been deemed to be safe throughout the world. Pressure is measured at the case mouth or from inside the case according to the CIP.

DO NOT ATTEMPT ANY EXTRAPOLATIONS. PLEASE FOLLOW THE DATA AS WRITTEN.

II. IT IS A MUST FOR EVERY RELOADER TO READ THE RELOADING SAFETY RULES ON THE PAGES 9-10 OF THIS GUIDE.

7mm TCU

Test barrel: 14", 1 in 10" twist

Primers: Small Rifle

Cases: Fireformed LAPUA .223 Remington,
trim-to length 1.752"

NOTE: This caliber is not supported by CIP or SAAMI. The listed maximum loads do not exceed 46500 psi.

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	Hornady	2.461	N120	22.8	2188	25.3	2441
				N130	25.0	2205	27.7	2469
				N133	27.3	2281	30.2	2540
	SSSP	Hornady	2.500	N120	20.4	1988	22.4	2150
				N130	22.4	2000	24.9	2209
				N133	25.0	2066	27.9	2300
130	Spitzer	Speer	2.559	N120	19.1	1779	21.3	1957
				N130	21.6	1879	23.9	2055
				N133	22.5	1888	25.0	2078
	SBT	Sierra	2.559	N120	18.0	1684	20.0	1844
				N130	20.2	1756	22.4	1922
				N133	21.2	1778	23.6	1964
160	SBT	Sierra	2.598	N135	22.2	1765	24.8	1960
				N120	17.3	1576	19.3	1742
				N130	19.5	1656	21.7	1831
				N133	20.2	1675	22.4	1832
				N135	22.4	1741	24.9	1911
				N540	22.9	1786	25.2	1961

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7mm BR Remington

Test barrel: 14½", 1 in 10" twist,
 Primers: Small Rifle
 Cases: Remington, trim-to length 1.512"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	Hornady	2.205	N120	26.8	2418	29.8	2721
				N130	29.2	2449	32.4	2748
120	SSSP	Hornady	2.228	N120	24.9	2171	27.8	2421
				N130	26.8	2191	29.9	2454
140	Ballistic Tip	Nosler	2.374	N133	29.4	2298	32.6	2529
				N120	22.1	1928	24.4	2100
150	Ballistic Tip	Nosler	2.374	N130	24.1	1953	26.7	2167
				N133	25.6	1993	28.4	2202
160	HPBT	Sierra	2.350	N120	21.8	1887	23.8	2032
				N130	23.3	1893	25.3	2083
				N133	24.7	1926	27.3	2107
				N135	26.0	1916	28.8	2132
				N120	19.9	1758	21.9	1904
				N130	21.6	1812	23.9	1975
				N133	23.5	1838	26.1	2030
				N135	24.8	1862	27.7	2066

7 x 49 GJW

Test barrel: 15", 1 in 8" twist
 Primers: Small Rifle
 Cases: MFT, trim-to length 1.920"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
150	Ballistic Tip	Nosler	2.953	N130	23.4	1942	25.7	2108
				N133	24.6	1940	26.9	2115
168	HPBT	Sierra	2.953	N135	26.6	1995	28.7	2158
				N130	22.7	1843	25.1	2005
				N133	24.1	1854	26.5	2025
				N135	26.3	1919	28.2	2070
				N140	27.3	1918	29.5	2087

.32 S.&W. Long N.P.

Test barrel: 7", 1 in 18½" twist
 Primers: Small Pistol
 Cases: Remington, trim-to length .913"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
83	LWC	LAPUA	.969	N310	1.5	767	1.7	856
98	LWC	LAPUA	.969	N310	1.1	618	1.3	691
98	LRN	LAPUA	1.272	N310	1.9	848	2.2	916

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.32 S.&W. Long Wadcutter

Test barrel: 7", 1 in 18½" twist
 Primers: Small Pistol
 Cases: Remington, trim-to length .913"

NOTE: The listed maximum load safe to use only with LAPUA headstamped cartridge cases!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
83	LWC	LAPUA	.969	N310	1.7	755	1.7	919
98	LWC	LAPUA	.969	N310	1.5	755	1.8	853

.380 ACP

Test barrel: 3½", 1 in 10" twist
 Primers: Small Pistol
 Cases: Sako, trim-to length .677"

Bullet				Powder	Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Velocity [fps]
90	HP-XTP	Hornady	.980	N310	2.9	1010	1010
				N320	3.6		
95	TMJ	Speer	.980	N310	3.0	994	994
				N320	3.7		
100	FMJ	Hornady	.980	N310	2.6	912	912
				N320	3.4		

9mm Luger

Test barrel: 4", 1 in 10" twist
 Primers: Small Pistol
 Cases: Remington, trim-to length .748"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
90	HP-XTP	Hornady	1.063	N310	4.0	1224	4.3	1272
				N320	4.9	1332	5.4	1397
				N330	5.6	1394	6.2	1455
				N340	5.7	1411	6.4	1508
				N350	6.6	1417	7.4	1522
100	HP	Speer	1.083	3N37	6.6	1453	7.4	1532
				N320	4.8	1243	5.3	1328
				N330	5.5	1309	6.0	1384
				N340	5.9	1319	6.6	1436
				3N37	6.7	1335	7.5	1452

NOTE!

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BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

9mm Luger (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
115	HP-XTP	Hornady	1.142	N320	4.1	1135	4.6	1206
				N330	5.0	1188	5.5	1272
				N340	5.5	1224	6.1	1327
				3N37	6.2	1237	6.9	1328
				N350	6.0	1243	6.6	1318
				N320	4.1	1086	4.5	1157
115	RN	Rainier	1.142	N330	4.7	1138	5.2	1201
				N340	5.1	1175	5.6	1245
				N350	5.8	1217	6.5	1304
				3N37	6.2	1211	6.6	1271
				N320	4.0	1030	4.4	1103
				N330	4.8	1132	5.3	1207
120	CEPP	LAPUA	1.130	N340	5.1	1155	5.7	1234
				N350	6.0	1194	6.5	1277
				3N37	5.7	1132	6.2	1209
				N320	3.8	1086	4.2	1138
				N330	4.5	1142	4.9	1186
				N340	4.8	1155	5.3	1230
124	LSWC	Intercast	1.142	3N37	5.5	1171	6.0	1234
				N350	5.1	1148	5.6	1205
				N320	4.0	1037	4.4	1115
				N330	5.0	1125	5.3	1196
				N340	5.3	1158	5.8	1233
				3N37	6.1	1188	6.6	1252
124	FMJ/FP	Hornady	1.142	N350	5.6	1161	6.1	1232
				3N38	6.5	1105	7.6	1237
				N320	3.8	1017	4.2	1086
				N330	4.4	1079	4.8	1146
				N340	4.7	1096	5.3	1171
				N350	5.5	1135	6.1	1216
130	FMJ	Sierra	1.142	3N37	5.5	1152	6.1	1214
				N320	3.7	997	4.1	1062
				N330	4.2	1047	4.6	1109
				N340	4.4	1079	4.9	1132
				N350	5.2	1096	5.6	1148
				3N37	5.1	1083	5.7	1145
145	LRN	Intercast	1.142	3N38	6.0	1017	6.8	1165
				N105	7.2	1171	7.5	1252
				N330	3.5	951	3.9	1016
				N340	4.0	997	4.4	1060
				N350	4.3	991	4.8	1066
				3N37	4.6	1001	5.1	1073

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

9mm Luger (cont'd)

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
147	HP/XTP	Hornady	1.142	N330	4.1	981	4.4	1050
				N340	4.1	965	4.4	1031
				3N37	4.8	997	5.3	1070
				N350	4.7	1010	5.1	1089
				3N38	6.0	994	6.2	1096
				N105	6.2	1056	6.5	1125
147	RN	Rainier	1.142	N330	3.6	906	3.9	954
				N340	3.9	909	4.2	977
				N350	4.3	955	4.8	1033
				3N37	4.6	955	5.0	1025
150	CEPP	LAPUA	1.130	N330	3.5	883	3.8	945
				N340	3.9	919	4.2	981
				N350	4.4	951	4.7	1012
				3N37	4.4	922	4.8	995

9 x 21

Test barrel: 5¹/₂", 1 in 10" twist

Primers: Small Pistol

Cases: Tanfoglio, trim-to length .826"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
100	HP	Speer	1.142	N340	6.0	1375	6.6	1467
				3N37	6.8	1411	7.5	1496
				N350	7.0	1430	7.7	1516
115	FMJ	Sierra	1.161	N340	5.4	1257	5.9	1322
				3N37	6.0	1240	6.6	1330
				N350	6.1	1283	6.6	1355
				N105	8.2	1355	8.8	1447
123	FMJ	LAPUA	1.161	N340	4.8	1148	5.3	1201
				3N37	5.4	1168	6.0	1229
				N350	5.5	1152	5.9	1222
				N105	6.9	1230	7.5	1311
147	HP-XTP	Hornady	1.161	3N37	4.9	1024	5.3	1087
				N350	4.6	1070	5.0	1115
				N105	5.9	1079	6.4	1147

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.357 SIG

Test barrel: 5", 1 in 16" twist
Primers: Small Pistol
Cases: Starline, trim-to length .860"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
95	FMJ	Speer	1.122	N340	8.1	1578	9.2	1714
				3N37	9.2	1611	10.3	1751
				N350	9.3	1614	10.5	1767
115	FMJ	Sierra	1.122	N340	6.9	1387	8.0	1528
				3N37	7.8	1424	8.9	1556
				N350	7.7	1413	9.0	1569
123	FMJ	LAPUA	1.122	N340	6.5	1305	7.6	1446
				3N37	7.5	1342	8.6	1480
				N350	7.5	1348	8.7	1490
123	Mega-shock	LAPUA	1.122	N340	6.5	1307	7.7	1387
				3N37	7.5	1347	8.6	1486
				N350	7.4	1341	8.8	1502
130	RN B	Rainier	1.122	N340	6.5	1262	7.4	1387
				3N37	7.5	1283	8.4	1360
				N350	7.3	1317	8.5	1454

.38 Super Auto

Test barrel: 5 1/2", 1 in 16" twist
Primers: Small Pistol
Cases: Remington +P, trim-to length .893"

NOTE: The listed maximum loads are SAAMI +P loads!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
115	HP-XTP	Hornady	1.240	N320	5.1	1188	5.9	1319
				N340	6.0	1250	6.9	1398
				3N37	6.5	1263	7.9	1430
115	FMJ	Sierra	1.276	N350	5.5	1171	7.1	1362
				N350	7.9	1358	9.1	1519
				3N37	7.5	1296	8.4	1453
115	RN	Rainier	1.240	N320	4.8	1171	5.7	1293
				N340	6.0	1253	7.0	1398
				N350	6.6	1273	7.9	1437
124	FMJ-FP	Hornady	1.260	3N37	6.9	1280	7.9	1417
				N340	6.0	1207	7.1	1355
				3N37	7.1	1227	7.7	1316
				N350	6.4	1201	7.5	1348
				3N38	8.0	1273	9.3	1463
				N105	10.0	1407	10.9	1594

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.38 Super Auto (cont'd)

NOTE: The listed maximum loads are SAAMI +P loads!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
124	LSWC	Intercast	1.260	N340	5.4	1204	6.4	1329
				N350	6.0	1217	7.1	1362
				3N37	6.3	1237	7.4	1368
130	FMJ	Sierra	1.260	N340	5.5	1145	6.3	1260
				3N37	6.3	1181	7.3	1309
				3N38	8.3	1270	9.0	1391
130	RN	Rainier	1.260	N105	9.3	1319	10.1	1457
				N340	5.4	1129	6.2	1230
				N350	5.9	1138	6.9	1273
145	LRN	Intercast	1.260	3N37	6.3	1165	7.2	1286
				N340	4.3	1033	5.2	1148
				3N37	5.5	1079	6.3	1207
147	HP/XTP	Hornady	1.260	N350	5.1	1047	6.0	1175
				N340	5.1	1033	5.9	1161
				3N37	5.9	1096	6.8	1220
147	RN	Rainier	1.260	N350	5.7	1073	6.5	1194
				3N38	7.7	1201	8.0	1224
				N105	7.8	1181	8.4	1293
147	RN	Rainier	1.260	N340	5.0	1053	5.7	1142
				N350	5.3	1007	6.1	1132
				3N37	5.5	1037	6.3	1145

.38 LAPUA Super

Test barrel: 5 $\frac{1}{2}$ ", 1 in 16" twist

Primers: Small Pistol

Cases: LAPUA, trim-to length 1.145"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
115	FMJ	LAPUA	1.240	N340	5.6	1191	6.3	1417
				3N37	6.8	1257	7.4	1424
				3N38	8.6	1355	9.7	1503
123	FMJ	LAPUA	1.260	N340	5.6	1184	6.2	1329
				3N37	6.8	1253	7.3	1345
				3N38	8.3	1266	9.1	1430
130	FMJ	Sierra	1.260	N340	5.3	1168	6.0	1273
				3N37	6.5	1194	7.1	1309
				3N38	7.7	1247	8.8	1421

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.38 Special

Test barrel: 6 $\frac{1}{2}$ ", 1 in 18" twist
 Primers: Small Pistol
 Cases: Sako, trim-to length 1.145"

NOTE: The listed maximum loads are SAAMI +P loads!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
110	HP/XTP	Hornady	1.437	N320	5.7	1188	5.9	1230
				N340	6.5	1191	6.7	1229
				3N37	7.7	1224	8.0	1266
				N350	7.1	1227	7.4	1266
124	LSWC	Intercast	1.437	N320	4.8	1079	5.0	1119
				N340	6.0	1125	6.2	1164
				3N37	6.6	1135	6.8	1170
				N350	6.4	1152	6.6	1183
125	FP/XTP	Hornady	1.437	N320	5.3	1043	5.4	1082
				N340	6.2	1102	6.4	1140
				3N37	7.2	1115	7.3	1160
				N350	7.0	1132	7.2	1178
125	FP	Rainier	1.437	N320	4.7	1017	5.0	1053
				N340	5.7	1066	6.0	1106
				N350	6.3	1070	6.6	1115
				3N37	6.6	1093	6.9	1140
140	HP	Speer	1.437	N320	5.0	955	5.1	1003
				N340	5.8	981	6.1	1030
				3N37	6.6	1010	6.9	1064
				N350	6.4	1004	6.7	1053
145	LSWC	Intercast	1.476	N320	4.1	938	4.4	971
				N340	5.3	1033	5.6	1076
				3N37	5.6	1001	5.9	1039
				N350	5.8	1043	6.2	1089
146	JHP	Speer	1.378	N340	5.0	922	5.2	963
				3N37	5.7	932	5.9	975
				N350	5.6	932	5.7	971
				N320	3.2	820	3.4	848
148	LWC	Sako	1.181	N330	3.6	840	3.7	875
				N340	3.9	863	4.0	895
				N350	4.3	892	4.5	928
				N320	4.2	794	4.4	843
158	HP	Speer	1.437	N340	5.2	876	5.4	929
				3N37	6.1	915	6.4	957
				N350	5.9	925	6.1	969
				N320	4.3	843	4.6	885
158	FP	Rainier	1.476	N340	5.3	879	5.5	923
				N350	5.9	922	6.1	963
				3N37	6.1	925	6.3	970

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.38 Special (cont'd)

NOTE: The listed maximum loads are SAAMI +P loads!

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
160	LFN	Intercast	1.476	N340 3N37 N350	5.4 5.7 5.7	1033 978 1014	5.6 6.0 5.9	1070 1021 1046

.357 Magnum

Test barrel: 7", 1 in 18¹/₂" twist

Primers: Small Rifle

Cases: Remington, trim-to length 1.283"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
110	HP/XTP	Hornady	1.575	N310	6.2	1296	6.7	1367
				N320	7.4	1390	8.0	1474
				N340	8.5	1458	9.4	1579
				3N37	9.5	1535	10.7	1646
				N350	9.9	1547	10.8	1647
				N110	18.5	1716	20.1	1909
123	LSWC	Intercast	1.614*)	N340	7.9	1375	8.8	1469
				N350	8.3	1387	9.3	1479
				N110	15.7	1546	17.4	1699
125	FP/XTP	Hornady	1.575	N310	5.5	1134	6.1	1234
				N320	6.2	1229	7.1	1329
				N340	7.8	1352	8.8	1462
				N350	8.7	1415	9.7	1512
				N110	16.8	1601	18.4	1772
140	HP	Speer	1.575	N340	7.6	1251	8.3	1340
				3N37	8.3	1278	9.3	1386
				N350	8.2	1280	9.1	1382
				N110	15.7	1499	17.1	1647
145	LSWC	Intercast	1.614*)	N320	5.8	1175	6.4	1245
				N340	6.6	1238	7.4	1319
				3N37	7.5	1269	8.5	1368
				N350	6.8	1231	8.1	1344
				N110	14.0	1475	15.3	1591
158	HP	Speer	1.575	N320	5.7	1023	6.3	1114
				N340	6.7	1117	7.4	1198
				3N37	7.4	1152	8.3	1254
				N350	7.6	1200	8.5	1276

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.357 Magnum (cont'd)

Bullet				Powder	Starting Load		Maximum Load				
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]			
158	FP/XTP HP LFN	Hornady	1.575	N105	10.9	1320	11.9	1417			
158		Speer	1.575	N110	14.1	1368	15.3	1502			
160		Intercast	1.575	N340	6.3	1181	7.1	1244			
				3N37	7.3	1176	8.0	1273			
				N350	6.6	1191	7.6	1270			
				N110	13.2	1404	14.4	1514			
			1.677*)	N340	6.3	972	7.1	1069			
180	TMJ	Speer	1.677*)	3N37	7.0	1013	7.9	1120			
180				N350	6.4	961	7.4	1087			
				N105	8.9	1154	10.3	1261			
				N110	12.7	1253	14.0	1394			
				3N37	6.4	891	7.2	991			
200			1.697*)	N350	6.2	838	7.1	966			
				N105	8.4	1020	9.4	1123			
				N110	11.4	1107	12.4	1204			

*) The CIP maximum cartridge overall length is exceeded.

.357 Remington Maximum

Test barrel: 12", 1 in 18 $\frac{1}{2}$ " twist

Primers: Small Rifle

Cases: Remington, trim-to length 1.598"

Bullet				Powder	Starting Load		Maximum Load			
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]		
158	FP/XTP	Hornady	1.890	3N37	10.1	1440	11.3	1560		
158				N350	8.6	1341	10.7	1528		
				N110	17.5	1737	19.4	1888		
158	FP	Rainier	1.890	N350	9.7	1309	11.8	1533		
160				3N37	9.5	1342	11.4	1539		
				N110	18.6	1740	20.2	1897		
160			1.890	3N37	9.1	1455	10.9	1572		
180	Silhouette	Nosler	1.894	N350	9.5	1445	10.6	1547		
				N110	15.5	1559	17.2	1695		
200				N120	20.4	1604	22.4	1752		
TMJ	Speer	2.000*)	N110	14.2	1361	16.0	1499			
		200				N120	18.9	1397	20.8	1573

*) The CIP maximum cartridge overall length is exceeded.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.40 S.&W.

Test barrel: 5¹/₂", 1 in 16" twist
 Primers: Small Pistol
 Cases: Remington, trim-to length .842"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
155	HP-XTP	Hornady	1.126	N320	5.2	1106	5.9	1191
				N330	6.0	1142	6.7	1234
				N340	6.0	1132	6.9	1250
				3N37	7.3	1171	8.1	1286
				N350	6.6	1152	7.6	1263
155	FP	Rainier	1.126	N320	5.3	1086	5.9	1171
				N330	6.0	1129	6.7	1224
				N340	6.4	1155	7.3	1276
				N350	7.2	1171	8.1	1296
				3N37	7.5	1178	8.5	1293
170	HP	Hornady	1.126	N340	5.3	1027	6.1	1135
				3N37	6.0	1056	7.0	1165
				N350	5.8	1056	6.8	1161
180	HP	Speer	1.126	N340	5.5	1001	6.1	1109
				3N37	5.8	994	6.8	1115
				N350	5.9	1047	6.7	1142
200	TMJ	Speer	1.126	N340	4.7	876	5.4	978
				3N37	5.1	869	6.0	988
				N350	5.3	892	6.0	991
				N105	7.5	1053	8.0	1132

10mm AUTO

Test barrel: 5¹/₂", 1 in 16" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length .988"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
155	HP-XTP	Hornady	1.256	N340	6.7	1165	7.6	1286
				3N37	7.2	1178	8.6	1316
				N350	7.1	1178	8.4	1316
155	FP	Rainier	1.256	N340	7.2	1211	8.0	1322
				N350	8.0	1243	8.9	1378
				3N37	8.2	1224	9.0	1345
180	HP	Speer	1.256	N340	6.0	1024	6.9	1155
				3N37	6.6	1093	7.8	1201
				N350	5.9	1076	7.2	1184
200	FMJ/FP	Hornady	1.256	N340	5.0	876	5.7	1014
				3N37	5.9	955	6.8	1073
				N350	5.3	932	6.3	1047
				N105	7.7	1066	8.6	1155

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.41 Remington Magnum

Test barrel: 6", 1 in 18^{3/4}" twist
 Primers: Large Pistol
 Cases: W-W Super, trim-to length 1.285"

Bullet				Powder	Starting Load		Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]	
170	JHC	Sierra	1.579	N350	11.1	1368	13.0	1526	
				N105	15.3	1539	17.5	1690	
				N110	21.7	1654	23.5	1795	
	HP/XTP	Hornady		N350	10.4	1221	11.8	1339	
				N105	13.0	1329	15.1	1470	
				N110	18.5	1431	20.3	1562	

.44 S.&W. Special

Test barrel: 6", 1 in 18" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length 1.153"

Bullet				Powder	Starting Load		Maximum Load		
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]	
180	HP-XTP	Hornady	1.469	N320	6.8	935	7.5	1033	
				N330	7.7	1010	8.6	1109	
				N340	8.8	1047	9.5	1145	
	HP-XTP	Hornady		N350	9.9	1043	10.5	1148	
				N320	6.4	886	7.0	965	
				N330	7.7	942	8.5	1033	
200	FPJ-Match	Sierra	1.469	N340	8.3	961	9.1	1066	
				N350	9.1	971	9.9	1079	
				N320	5.2	725	5.9	837	
	JTC-Sil	Hornady		N330	6.2	761	7.0	889	
				N340	6.6	814	7.4	912	
				N350	7.7	833	8.6	948	
220	FPJ-Match	Sierra	1.469	N320	4.9	633	5.6	732	
				N330	5.5	676	6.2	768	
				N340	6.3	728	7.1	827	
	LFN	Intercast		N350	7.5	784	8.2	889	
				N320	4.7	633	5.5	741	
				N330	5.0	627	6.0	748	
240	JTC-Sil	Hornady	1.480	N340	5.5	646	6.5	778	
				N350	6.7	751	7.6	853	
				N320	5.3	794	6.0	860	
	FPJ-Match	Sierra		N330	6.3	856	7.0	922	
				N340	6.5	840	7.1	912	
				N350	7.3	850	8.0	925	

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.44 Remington Magnum

Test barrel: 7", 1 in 20" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length 1.275"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
180	HP-XTP	Hornady	1.602	N320	10.2	1300	11.7	1424
				N340	12.5	1401	14.0	1539
				N350	13.2	1430	15.2	1568
				N110	24.7	1585	26.2	1686
200	HP-XTP	Hornady	1.602	N320	9.6	1218	11.2	1331
				N340	11.3	1313	12.9	1426
				3N37	13.2	1386	15.0	1506
				N350	12.1	1320	14.5	1476
				N105	15.9	1456	19.2	1630
				N110	23.7	1577	26.2	1729
220	FPJ-Match	Sierra	1.602	N320	8.6	1118	10.3	1224
				N340	10.7	1222	12.2	1321
				N350	12.1	1274	14.6	1430
				N320	8.7	1059	9.7	1154
240	JTC-Sil	Hornady	1.602	N340	9.9	1148	11.4	1240
				3N37	11.6	1185	13.2	1309
				N350	11.6	1202	12.7	1301
				N105	13.9	1286	16.4	1424
				N110	19.8	1386	21.9	1531
				N320	8.1	994	9.6	1121
250	FPJ-Match	Sierra	1.602	N340	9.6	1084	11.1	1205
				N350	11.0	1166	13.0	1287
				N340	10.1	1149	11.4	1227
				3N37	11.4	1166	13.1	1276
267	LFN	Intercast	1.681*)	N350	10.9	1152	12.6	1254
				N110	19.8	1351	21.7	1468
				N340	9.2	974	10.4	1055
				N350	10.1	999	11.6	1119
300	HP-XTP	Hornady	1.717*)	N110	18.1	1218	20.1	1363
				N340	9.1	944	10.1	1039
				3N37	9.6	968	11.1	1081
				N350	9.4	935	10.9	1062
				N105	12.2	1091	13.7	1200
				N110	17.3	1176	18.9	1296

*) The CIP maximum cartridge overall length is exceeded.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.45 AUTO

Test barrel: 6", 1 in 16" twist
Primers: Large Pistol
Cases: Remington, trim-to length .893"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
154	LSWC	Intercast	1.240	N320	5.9	1050	6.5	1134
				N340	7.7	1145	8.3	1227
180	LSWC	Intercast	1.244	N320	5.5	988	6.1	1070
				N340	6.9	1037	7.5	1121
185	TMJ-SWC	Speer	1.268	N320	5.7	929	6.2	1003
				N340	7.2	1010	7.8	1100
200	LSWC	Intercast	1.240	N320	4.8	902	5.2	973
				N340	6.2	981	6.7	1054
200	FMJ-CT	Hornady	1.240	N320	5.0	869	5.5	942
				N340	6.3	922	6.9	1002
230	FMJ-RN	Hornady	1.260	N320	4.9	797	5.3	863
				N340	6.0	846	6.5	928
				N350	6.8	860	7.3	935

.45 Colt

Test barrel: 6", 1 in 16" twist
Primers: Large Pistol
Cases: Remington, trim-to length 1.279"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
180	LSWC	Intercast	1.594	N320	8.2	1085	9.0	1170
				N330	9.9	1152	10.6	1241
				N340	10.3	1150	11.1	1245
				N350	11.1	1144	12.3	1262
185	HP/XTP	Hornady	1.594	N320	8.5	1062	9.3	1147
200	FMJ-CT			N320	7.7	1007	8.6	1089
200	LSWC	Hornady	1.594	N320	8.3	1042	9.1	1111
	N340			10.5	1089	11.3	1164	
230	FMJ-Match	Sierra	1.594	N320	7.3	912	8.0	978
				N340	9.4	949	10.2	1045
250	HP-XTP	Hornady	1.594	N320	7.0	813	7.6	888
				N340	9.0	888	9.6	973
				N350	10.5	943	10.9	1022

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.45 Winchester Magnum

Test barrel: 12", 1 in 16" twist
 Primers: Large Pistol
 Cases: Winchester, trim-to length 1.192"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
185	HP/XTP	Hornady	1.516	3N37	15.0	1706	16.8	1795
200	TMJ-SWC	Speer	1.516	3N37	14.6	1640	16.0	1726
200	FMJ-CT	Hornady	1.555	N105	17.7	1663	20.2	1824
200	TMJ-SWC	Speer	1.516	N110	24.1	1808	26.3	1962
230	FMJ-RN	Hornady	1.555	3N37	13.4	1411	14.9	1545
				N110	22.8	1683	25.0	1804
250	HP-XTP	Hornady	1.504	3N37	11.9	1211	13.8	1427
				N110	19.8	1512	22.4	1640

.454 Casull

Test barrel: 7 1/2", 1 in 24" twist
 Primers: Small Rifle
 Cases: Starline, trim-to length 1.380"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
185	HP/XTP	Hornady	1.642*	3N37	17.6	1752	21.0	1962
				N350	18.2	1772	21.4	1959
				N105	26.6	2001	29.3	2159
225	JHP	Speer	1.681	3N37	16.8	1558	19.6	1719
				N105	24.6	1765	26.7	1913
				N110	30.8	1864	33.5	2005
250	HP/XTP	Hornady	1.685	3N37	15.6	1437	18.2	1601
				N105	21.4	1585	24.3	1765
				N110	28.1	1719	30.7	1873
300	UCHP	Speer	1.752	3N37	15.2	1296	17.0	1414
				N105	19.7	1408	23.0	1588
				N110	26.3	1555	28.7	1686

*) The bullet crimp is over the ogive.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.50 AE

Test barrel: 6", 1 in 19" twist
Primers: Large Pistol
Cases: Speer, trim-to length 1.275"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
300	JHP	IMI	40.0	N105	19.5	1296	21.3	1434
				N110	25.3	1299	28.6	1499
325	UCHP	Speer	40.0	N120	32.5	1188	36.0	1368
				N105	17.7	1168	19.5	1335
				N110	24.1	1270	27.0	1460
				N120	30.7	1139	34.5	1339

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Vihtavuori Smokeless Loads for Cowboy Action Shooting

About the Data

These loads are developed to give the velocities required for the cowboy action shooting using revolvers with lead bullets. The maximum load is determined by the velocity limit about 1000 fps, or by the maximum pressure limit according to the SAAMI March 9, 1993 (Z299.3-1993). The bold text in the tables indicate the maximum load according to SAAMI pressure level. **The maximum loads must never be exceeded.**

All the listed loads are intended to be used in modern firearms, which are according to the SAAMI requirements. Please use a competent gunsmith to evaluate that the condition of your gun is adequate to be used with the pressures indicated in the tables. The starting loads are the lowest charges which appeared to give clean burning, i.e. no unburned residues in the barrel or in the case, in our test shooting. This limit may, however vary according to the individual revolver used.

There are some special features, which must be considered, when using reduced loads like the ones presented in the tables below. The same facts are equally valid always when using any smokeless powder in such loads.

1) Double charges

Some of these loads are so small that throwing the load twice in the same case is possible because of the large case volume. Doubling the charge accidentally causes

most probably truly lethal chamber pressures. Therefore, it is a must for everyone using this data to check visually every single load for the double charge before seating the bullet.

2) Free space in the case

When using charges which leave large amount of free space in the case, the shooting characteristics may vary largely depending on where the powder is located in the case. If the powder lies totally in the bottom of the case (i.e. in the end where primer is), the muzzle velocity and especially the maximum pressure become much higher. The maximum pressure may even be doubled when same powder charge is moved from the bullet end to the primer end of the case. This can simply be demonstrated by shaking the revolver barrel upwards or barrel downwards just before turning it smoothly in horizontal position, aiming and shooting. Also the recoil may transfer the powder in either end of the case. This is sometimes seen as a velocity change between the first shot and the following shots.

The shot to shot deviations in velocity and pressure are normally increased when using load which leaves the cases half empty. For this reason such loads are not recommended for target loads. The data below is tested in a way that the powder is as much as possible in the primer side before firing, and therefore, the pressures and the velocities represent the maximum values which were obtained using our test equipment and cartridge components indicated in the table.

3) Risk for underload detonation

This risk is always present when using highly reduced loads of any smokeless powder. The large free space in the case may generate a pressure wave which can cause, in the worst case, powder to burn as a shock wave, i.e. to detonate, instead of normal fast burning process. The extremely sharp pressure peaks involved in detonation can destroy the weapon and may lead to serious injury.

All these loads given here are extensively pressure tested and no signs of underload detonation were found. We strongly recommend everyone to follow strictly these tables to minimize the risk for underload detonation.

Warnings

Smokeless powder differs considerably in its burning characteristics from common "black powder". Black powder burns essentially at the same rate in the open (unconfined) as when in a gun. The burning rate of smokeless powder increases with increasing pressure. If burning smokeless powder is confined, gas pressure will rise and eventually can cause the container or chamber to burst. A slight increase in smokeless powder charge after maximum load causes sharp increase in maximum pressure in the chamber. **Never exceed the maximum loads.**

.38 Special

Test barrel: 5", 1 in 18" twist

Primers: Small Pistol

Cases: Remington, trim-to length 1.145"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
158	LSWC/HP		1.437	3NSL	2.8	726	3.3	807
				N320	3.3	754	3.8	840
				3NSM	3.6	787	4.1	884

.357 Magnum

Test barrel: 6", 1 in 18½" twist

Primers: Small Rifle

Cases: Remington, trim-to length 1.283"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
158	LSWC/HP		1.575	3NSM	3.9	791	5.0	998
				N340	4.5	804	5.9	1049
				3NSH	4.8	840	5.9	1053

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.44 S.&W. Special

Test barrel: 6½", 1 in 18" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length 1.153"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
240	SWC/HP		1.539	3NSL	4.4	722	5.3	832
				N320	4.7	701	5.9	852
				3NSM	5.5	750	6.3	885
				3NSL	3.6	641	4.7	767
267	LFN		1.539	N320	3.8	633	5.3	794
				3NSM	4.9	708	5.9	833
				N340	6.6	857	7.3	926

.44 Remington Magnum

Test barrel: 7", 1 in 20" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length 1.275"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
267	LFN		1.575	N340	5.9	734	7.5	946
				3NSH	6.4	796	7.8	968

.45 Colt

Test barrel: 6", 1 in 16" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length 1.279"

Bullet				Powder	Starting Load		Maximum Load	
Weight [grs]	Type	Mfg.	C.O.L. [in.]	Type	Weight [grs]	Velocity [fps]	Weight [grs]	Velocity [fps]
200	RN		1.594	3NSL	6.3	850	7.3	1008
				N320	6.8	848	8.7	1044
				3NSM	8.0	877	8.6	979
				3NSL	5.1	744	6.1	875
250	RN		1.594	N320	5.6	751	6.9	914
				3NSM	6.3	780	7.5	961
				3NSH	8.2	870	9.2	1004

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

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Dear Customer,

Thank you for showing interest in **Vihtavuori Smokeless Powders**, the most clean burning, accurate, consistent reloading powder in the world.

We hope our reloading guide has been informative and useful to you. For more in depth information, we also offer a hard bound **Vihtavuori Reloading Manual**. Distribution of **Vihtavuori Powders** is from the manufacturer to the exclusive importer.

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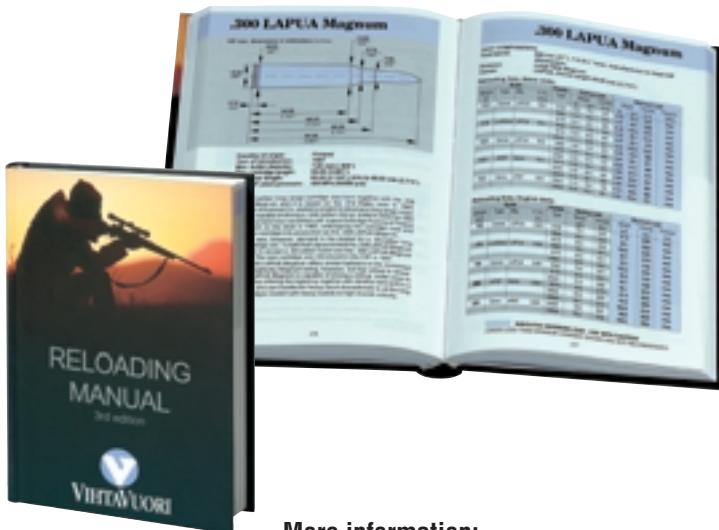
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